

KIC 012155411

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012155411-01	OBS	No	312.893154	202.172264	869.2	23.102	8.9	7.8	0.92	5881	2.77	1.10
012155411-02	OBS	No	370.036917	243.545621	687.8	9.842	7.4	6.2	0.92	5881	2.71	0.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012155411-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
012155411-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

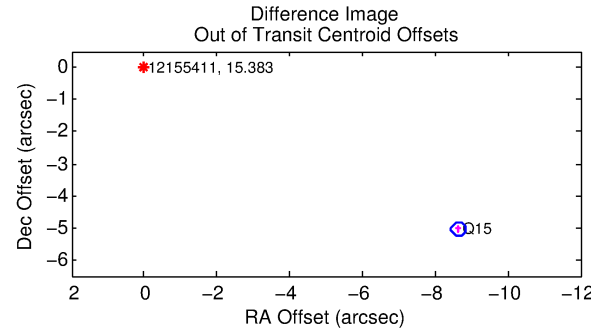
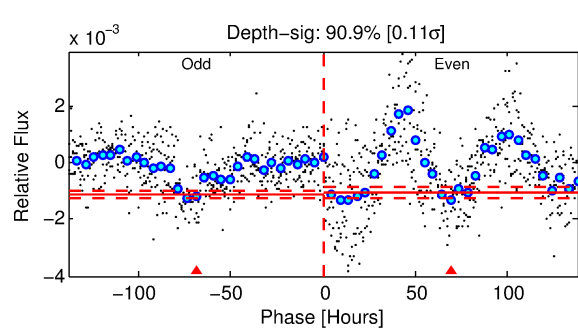
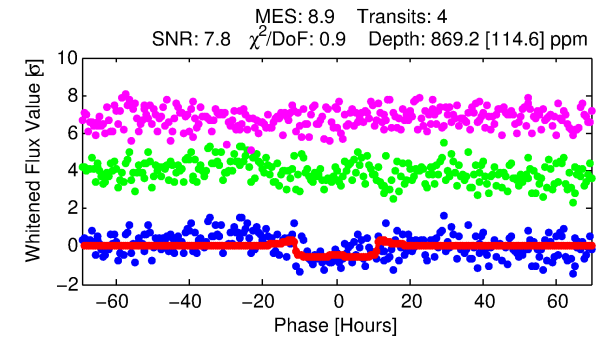
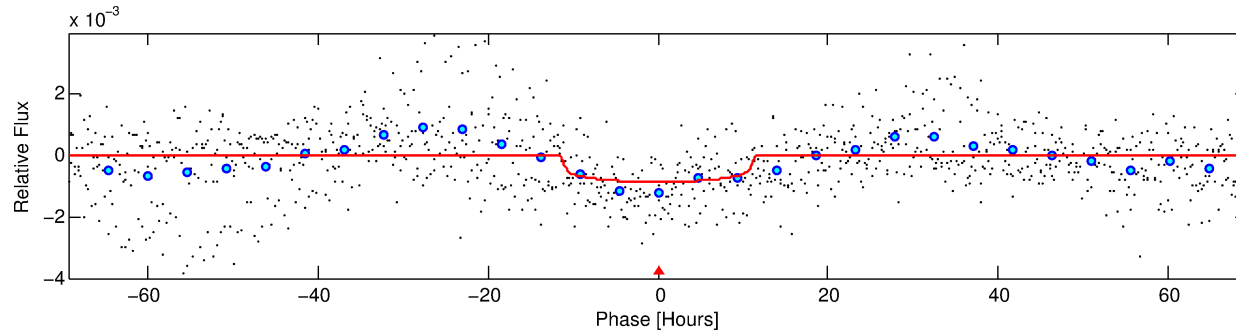
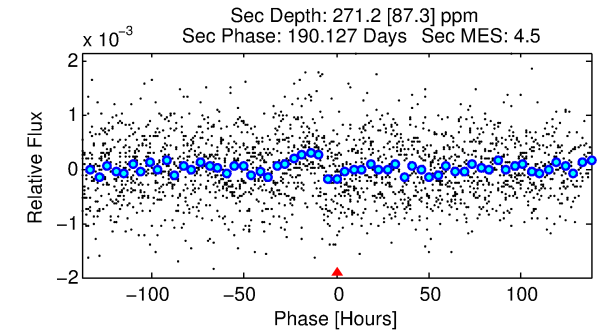
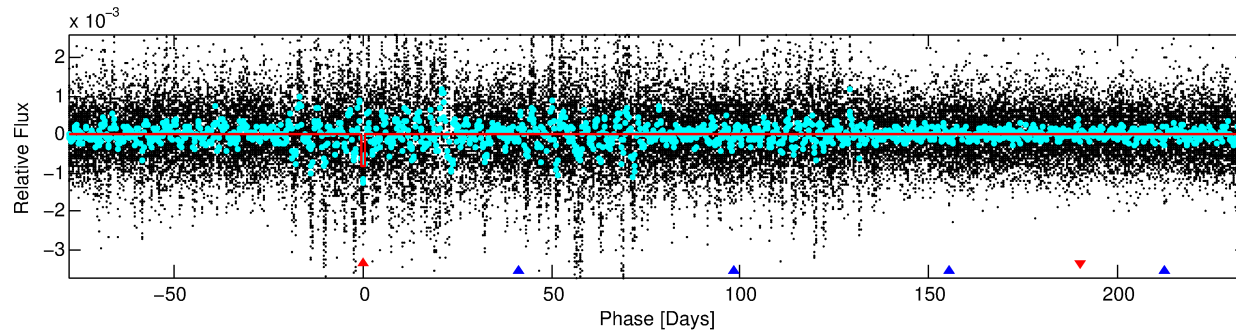
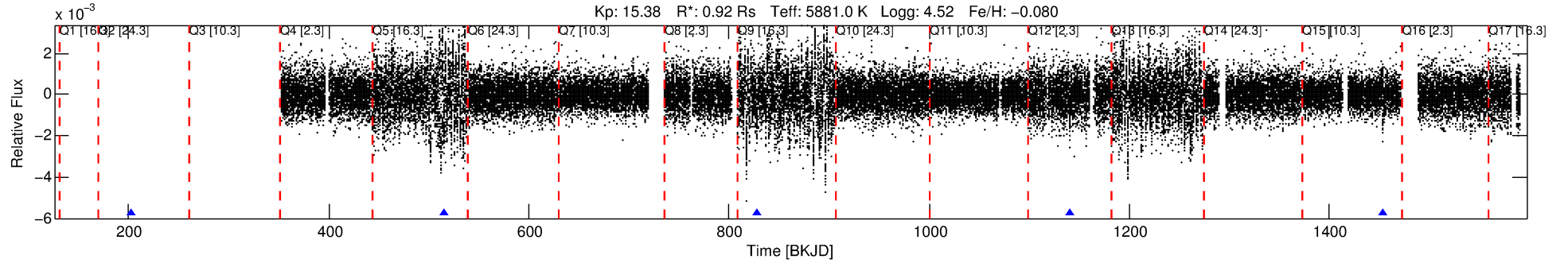
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012155411-01

No Significant Match Found

DV One-Page Summary

KIC: 12155411 Candidate: 1 of 2 Period: 312.893 d



DV Fit Results:

Period = 312.89315 [0.01168] d
Epoch = 202.1723 [0.0372] BKJD
Rp/R* = 0.0278 [0.0066]
a/R* = 91.62 [94.06]
b = 0.52 [1.44]
Seff = 1.10 [0.46]
T_{eq} = 261 [27] K
Rp = 2.77 [1.08] Re
a = 0.9028 [0.2405] AU
Ag = 15829.48 [11059.20] [1.43σ]
T_{eff} = 4530 [670] K [6.36σ]

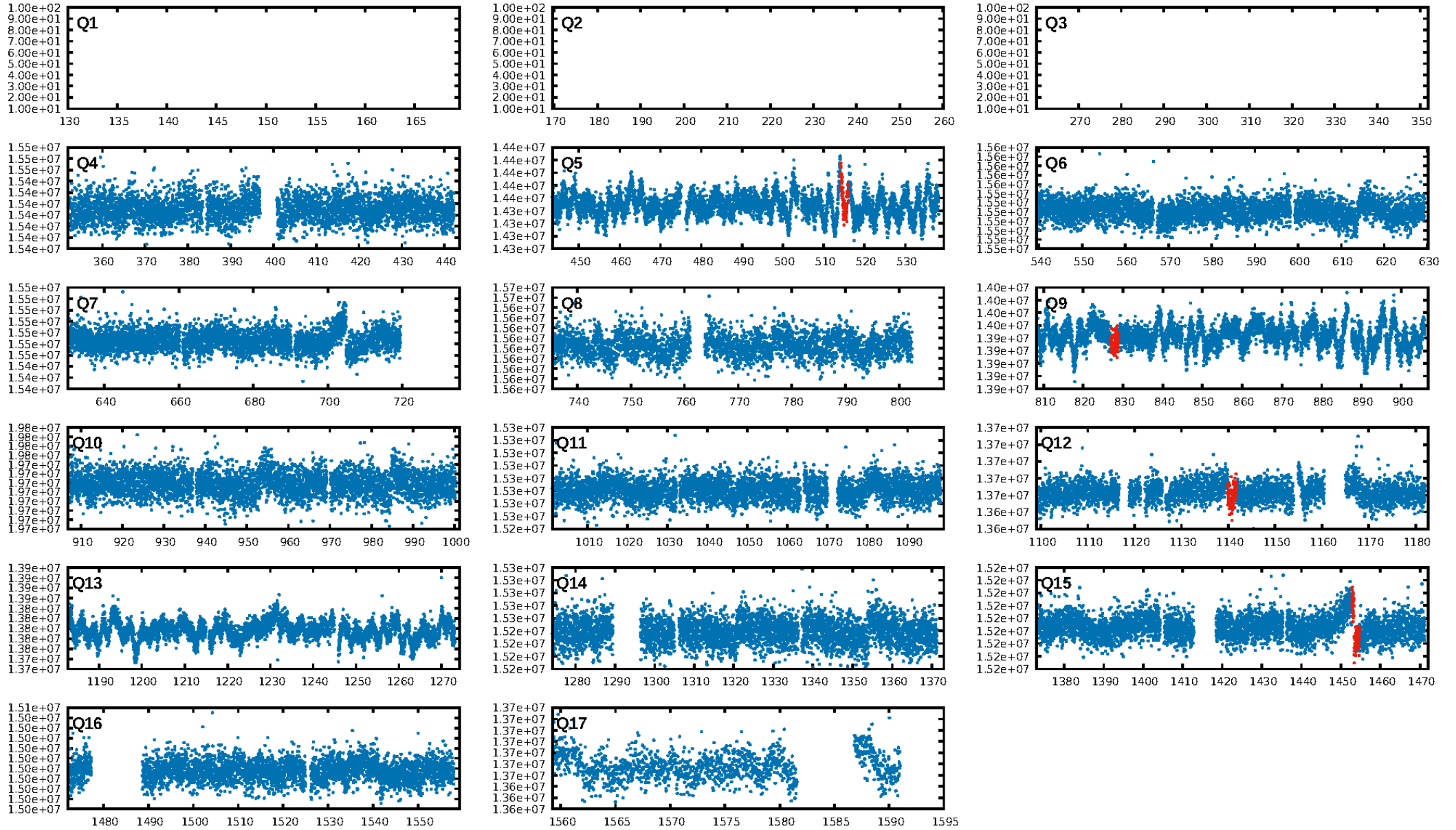
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [54.61σ]
ModelChiSquare2-sig: 42.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.01e-18
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.3837
Centroid-sig: 7.3%
Centroid-so: 3.944 arcsec [3.18σ]
OotOffset-rm: 9.995 arcsec [146.76σ]
KicOffset-rm: 10.447 arcsec [4.97σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [4/4]

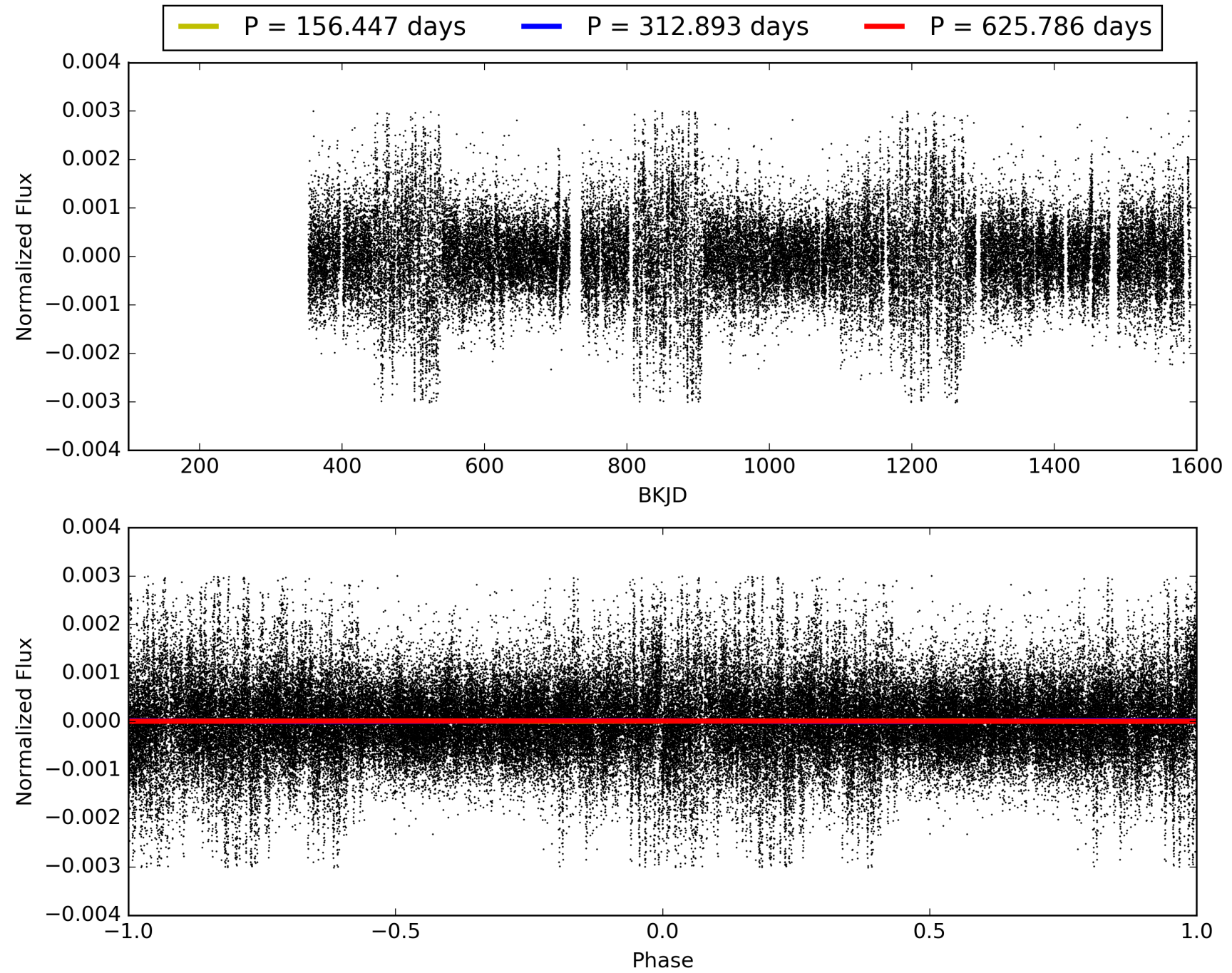
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012155411-01, PDC Light Curves

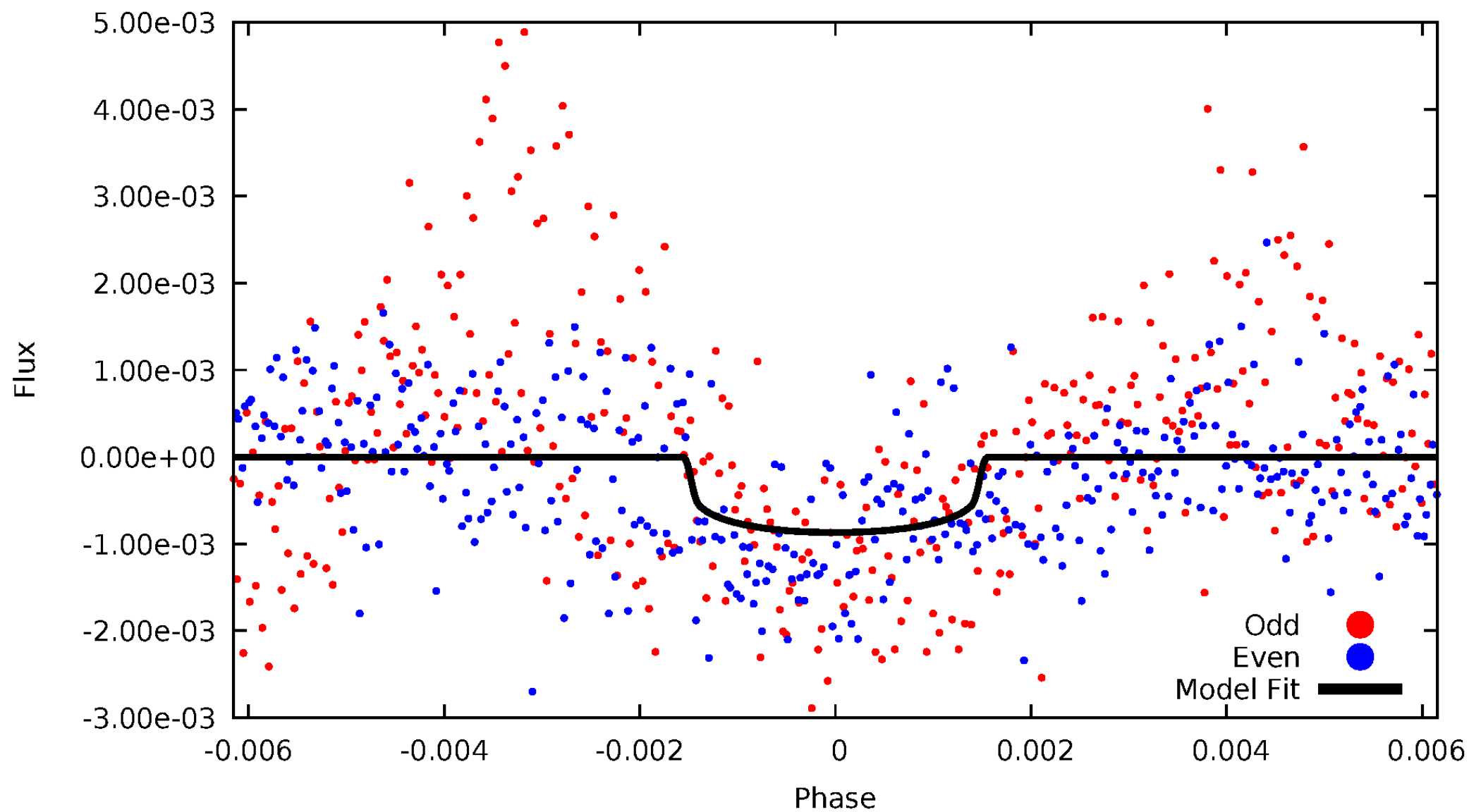


TCE 012155411-01



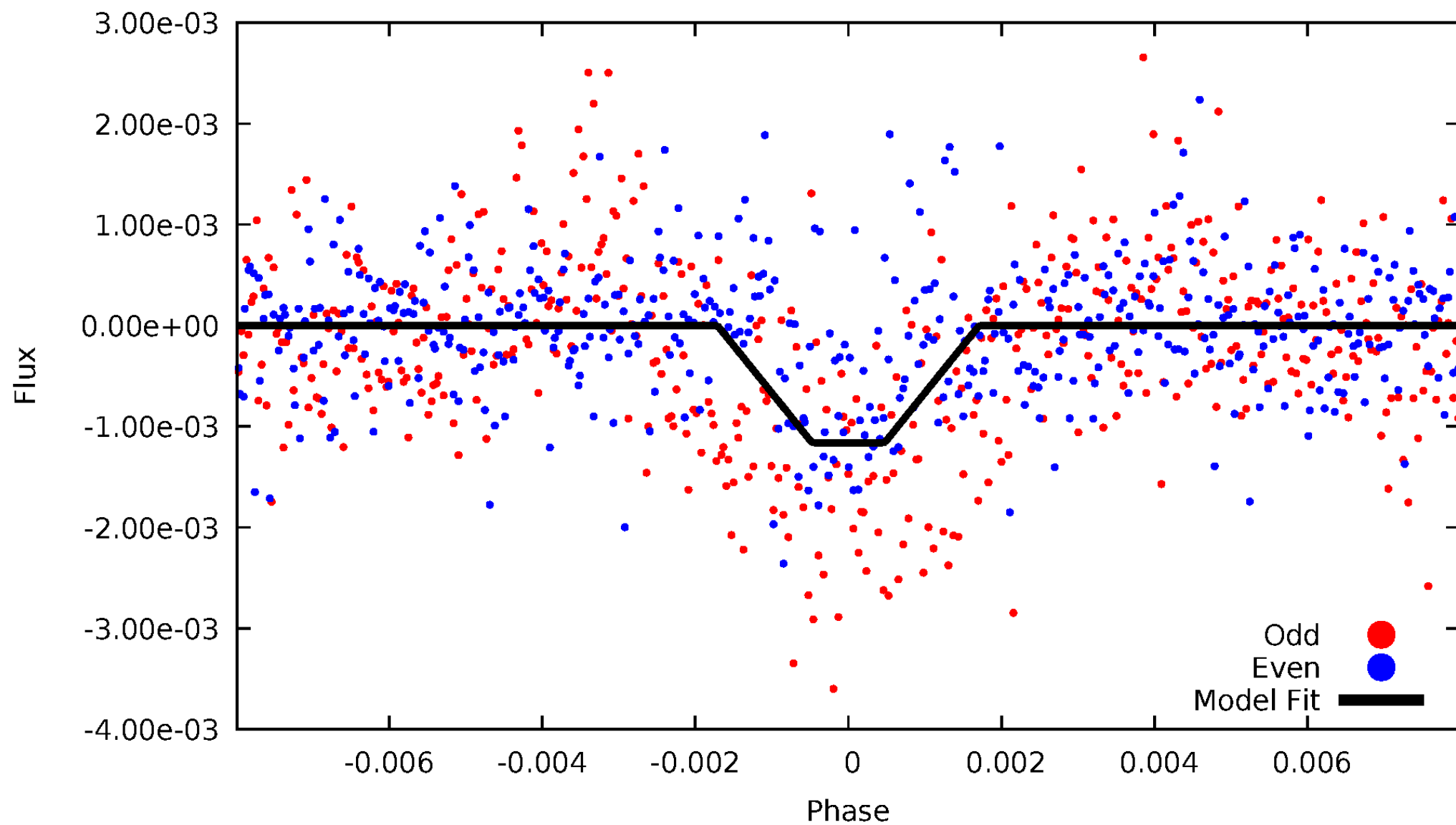
DV Odd/Even

TCE 012155411-01

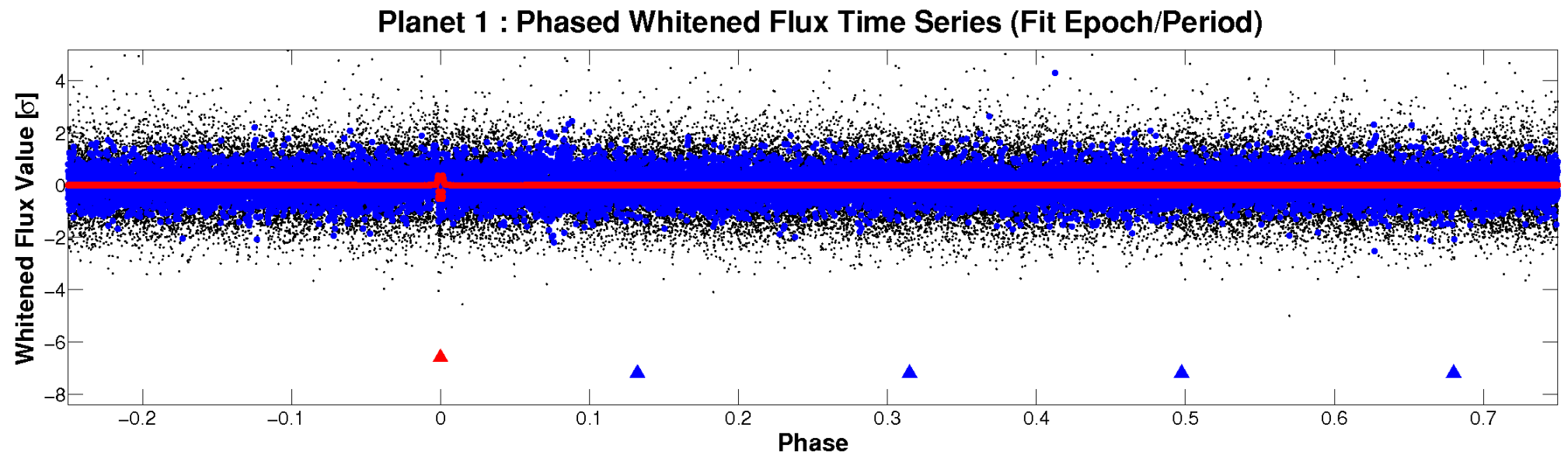
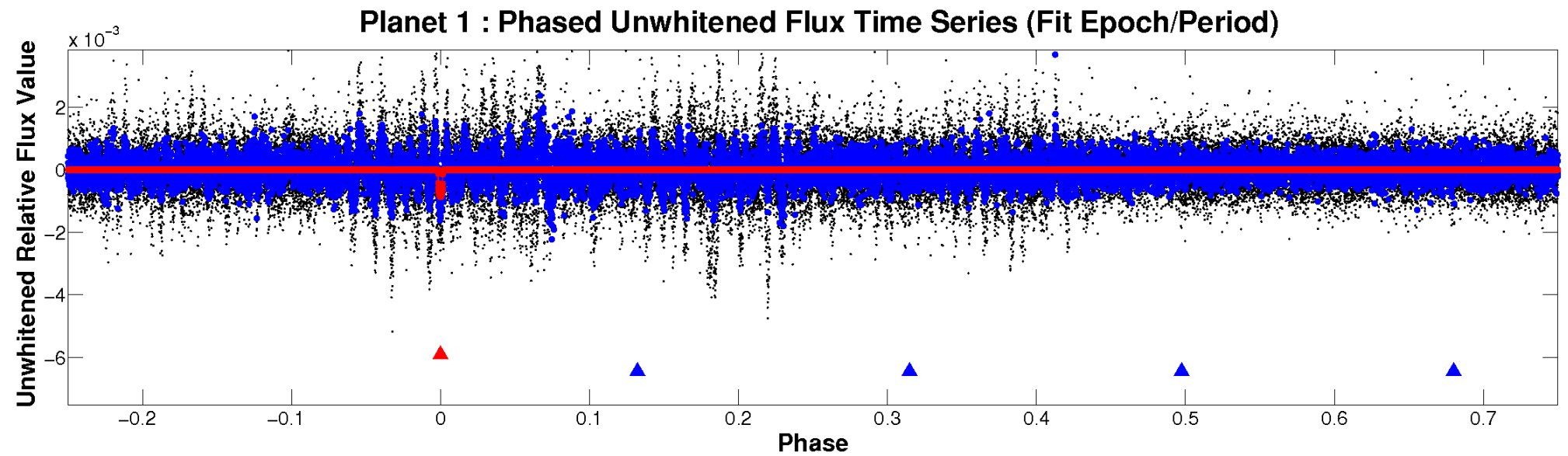


ALT Odd/Even

TCE 012155411-01

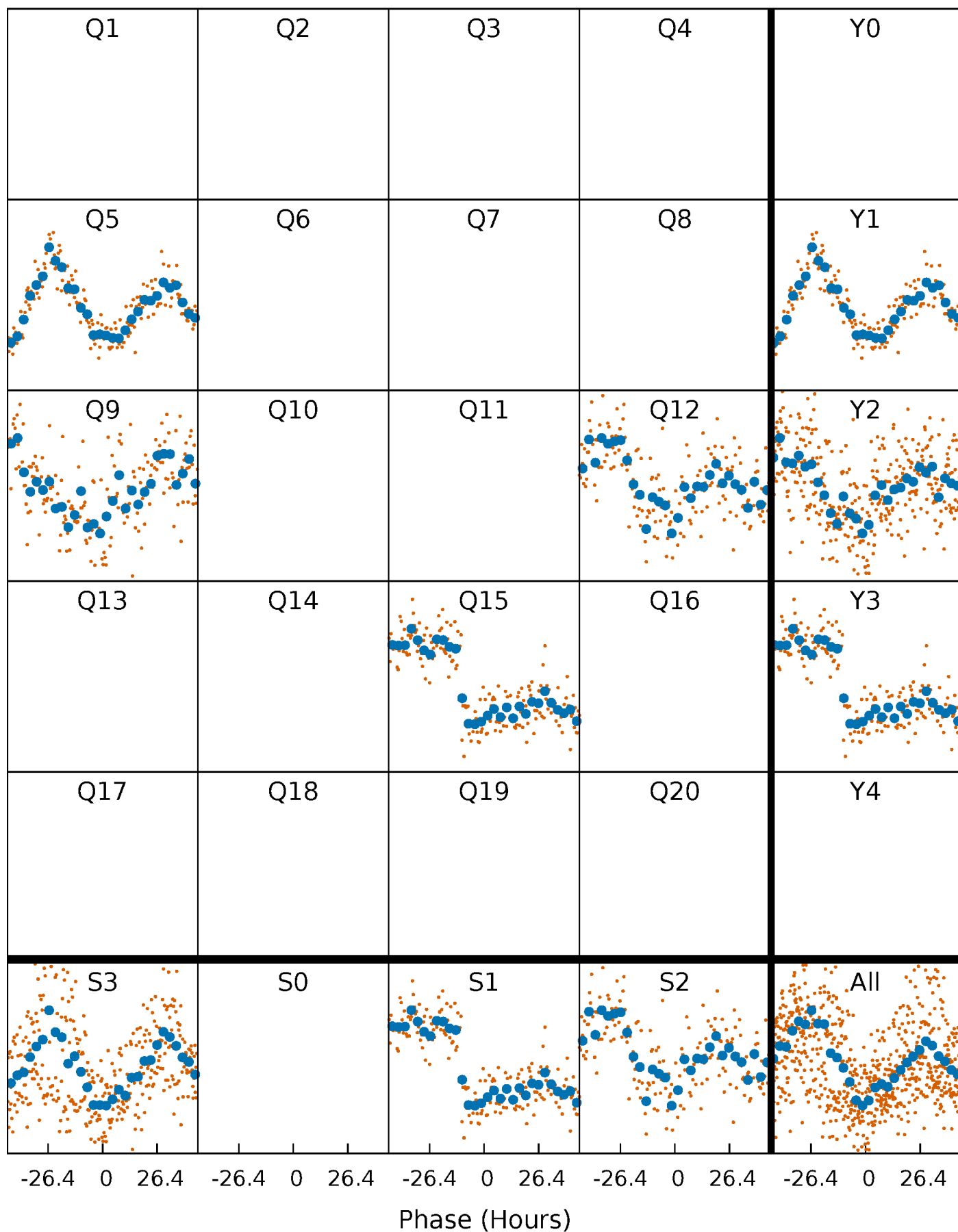


Non-Whitened Vs. Whitened Light Curve



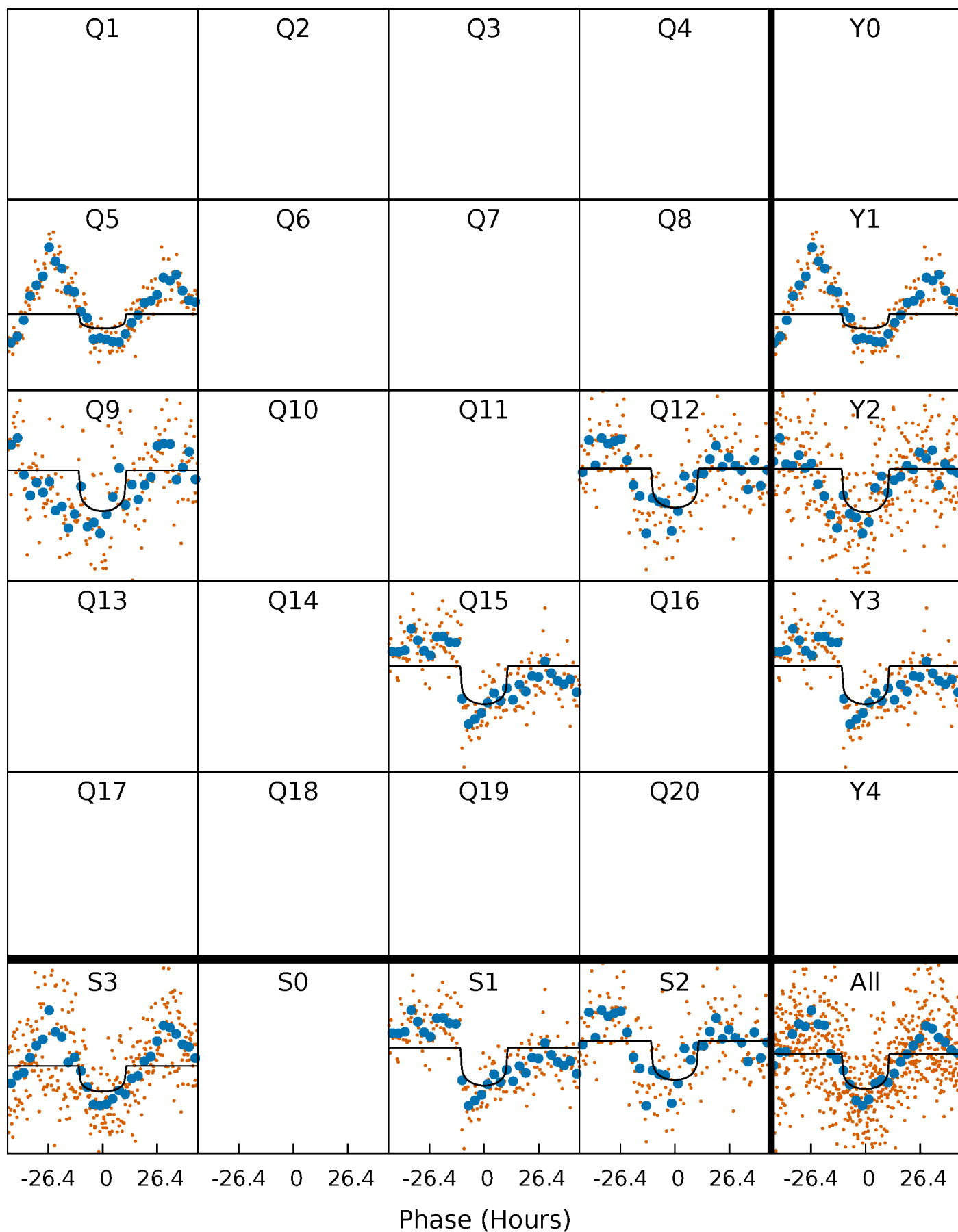
PDC Quarter-Phased Transit Curves

TCE 012155411-01 P=312.893154 Days $T_0=202.172264$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 012155411-01 P=312.893154 Days $T_0=202.172264$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

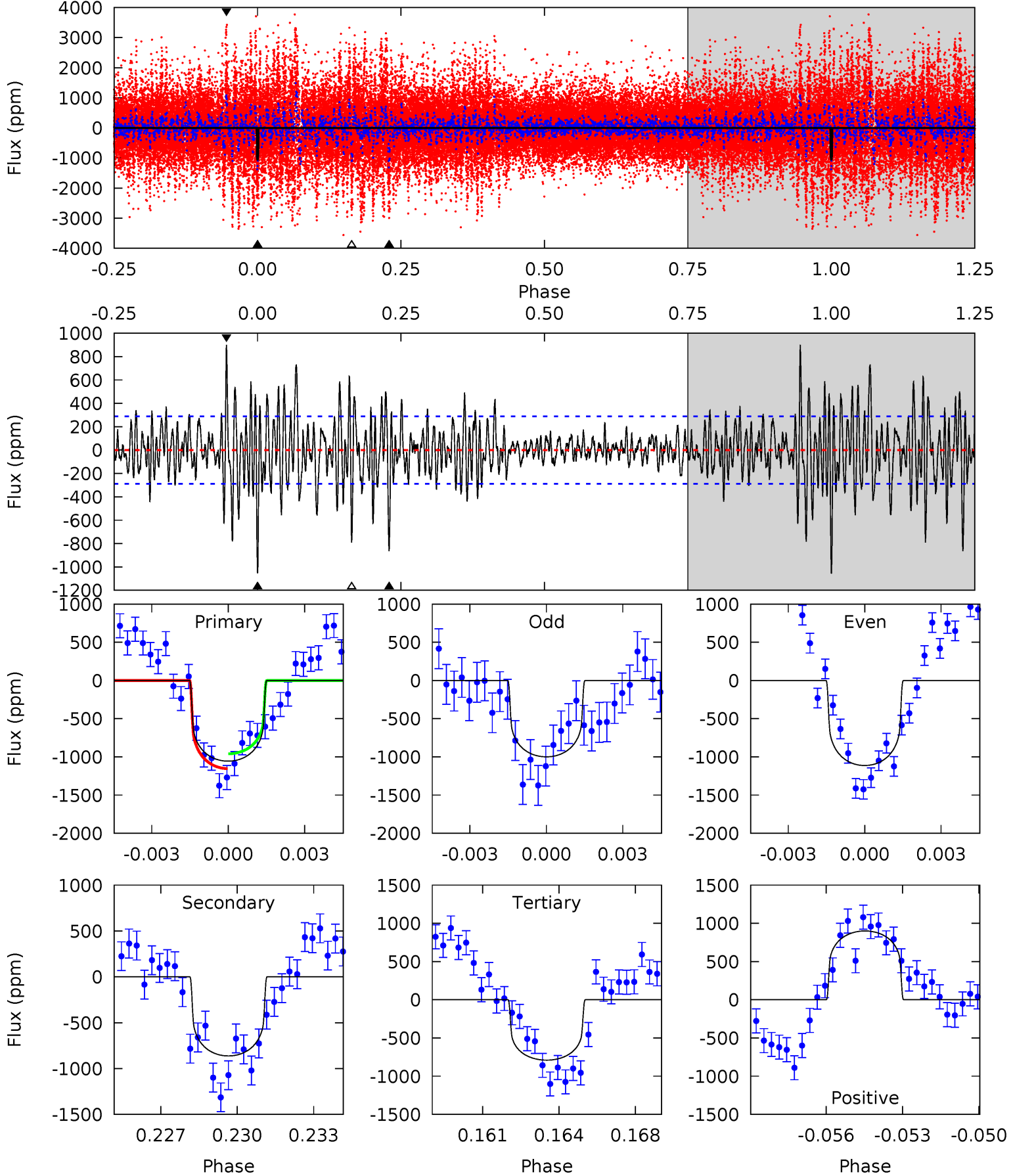
TCE 012155411-01 P=312.851426 Days $T_0=202.199356$ (BKJD)



DV Model-Shift Uniqueness Test

012155411-01, P = 312.893154 Days, E = 202.172264 Days

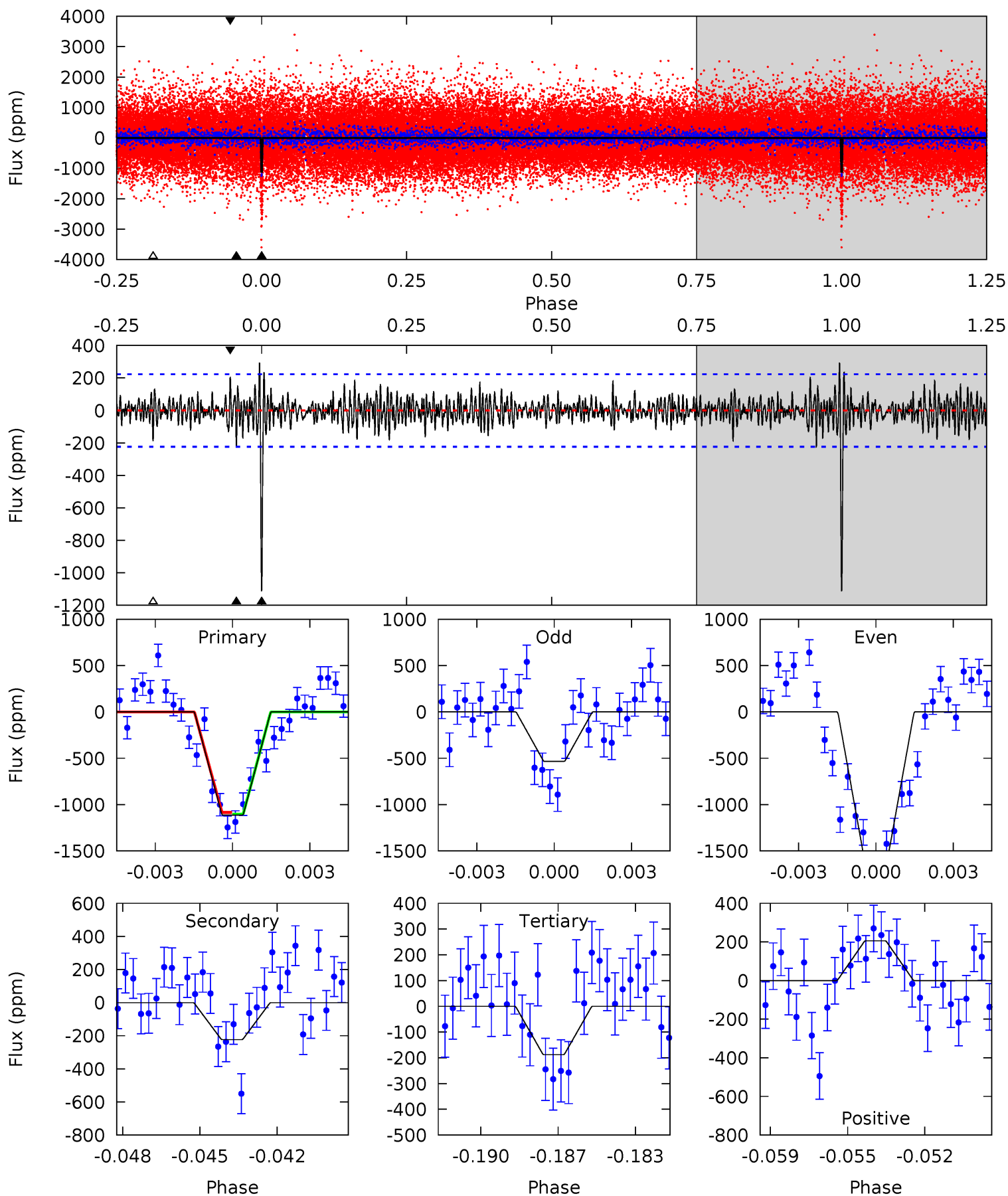
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.2	15.7	14.4	16.4	5.25	2.96	3.52	4.84	2.84	1.32	-0.68	1.01	1.05	0.46	1.77



Alt Model-Shift Uniqueness Test

012155411-01, P = 312.851426 Days, E = 202.199356 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	5.23	4.39	4.81	5.23	2.92	1.36	21.7	21.2	0.84	0.42	13.2	1.10	0.21	0.22



Stellar Parameters For KIC 012155411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5881^{+164}_{-205}	$4.516^{+0.039}_{-0.221}$	$-0.080^{+0.300}_{-0.300}$	$0.915^{+0.282}_{-0.094}$	$1.002^{+0.127}_{-0.140}$	$1.840^{+0.389}_{-0.982}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+13%/-14%	+21%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012155411-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-863 ± 55	$2.95^{+0.89}_{-0.77}$	376^{+26}_{-19}	5982^{+955}_{-585}	43150^{+34316}_{-17118}
Alt.	-223 ± 43	$3.56^{+0.98}_{-0.73}$	373^{+28}_{-17}	4164^{+384}_{-335}	7714^{+4648}_{-3071}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

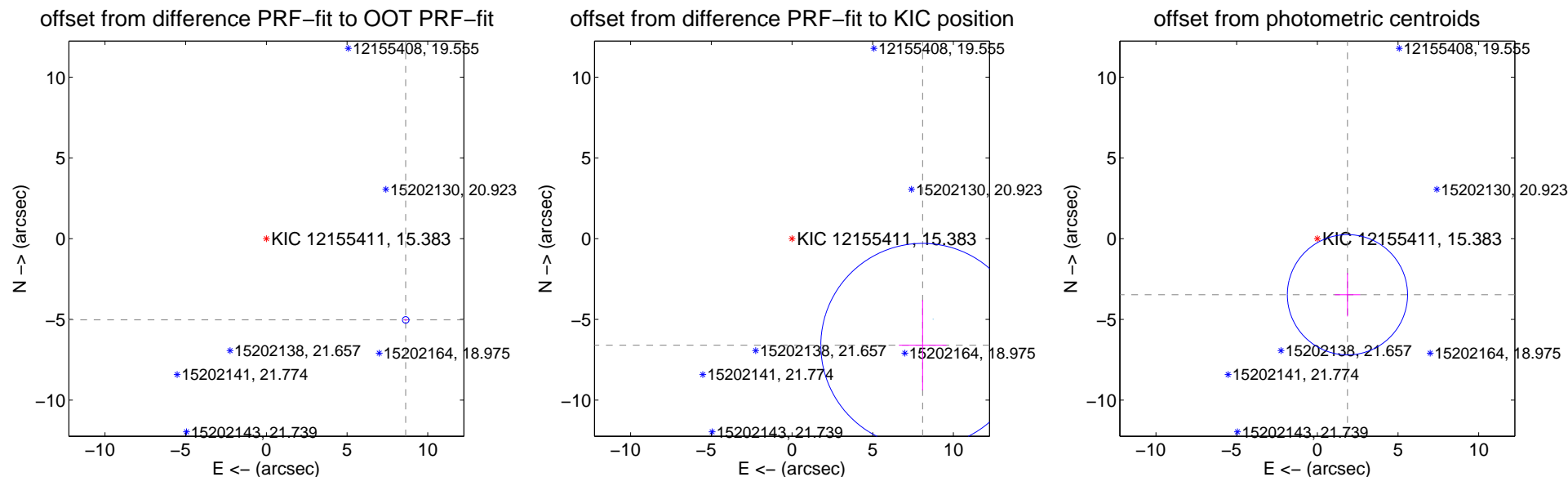
DV Centroid Data

Supplemental centroid analysis for 012155411-01. Kepler magnitude: 15.38. Transit SNR 7.78

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.995 ± 0.068	146.76	-8.635 ± 0.068	-5.033 ± 0.069
PRF-fit source offset from KIC position	10.447 ± 2.103	4.97	-8.096 ± 1.475	-6.603 ± 2.794
photometric centroid source offset	3.94 ± 1.24	3.18	-1.87 ± 0.79	-3.47 ± 1.34

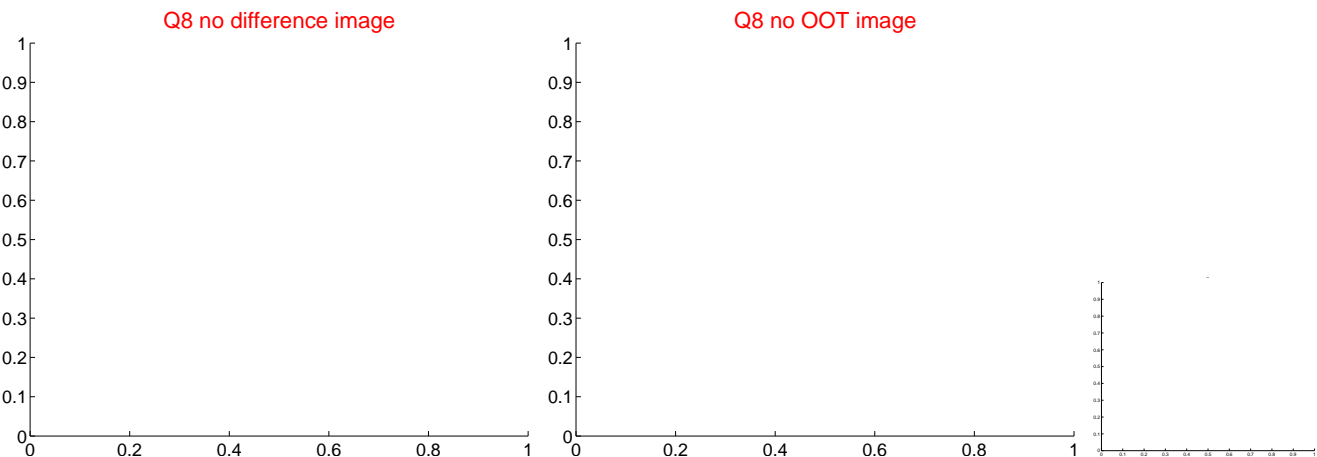
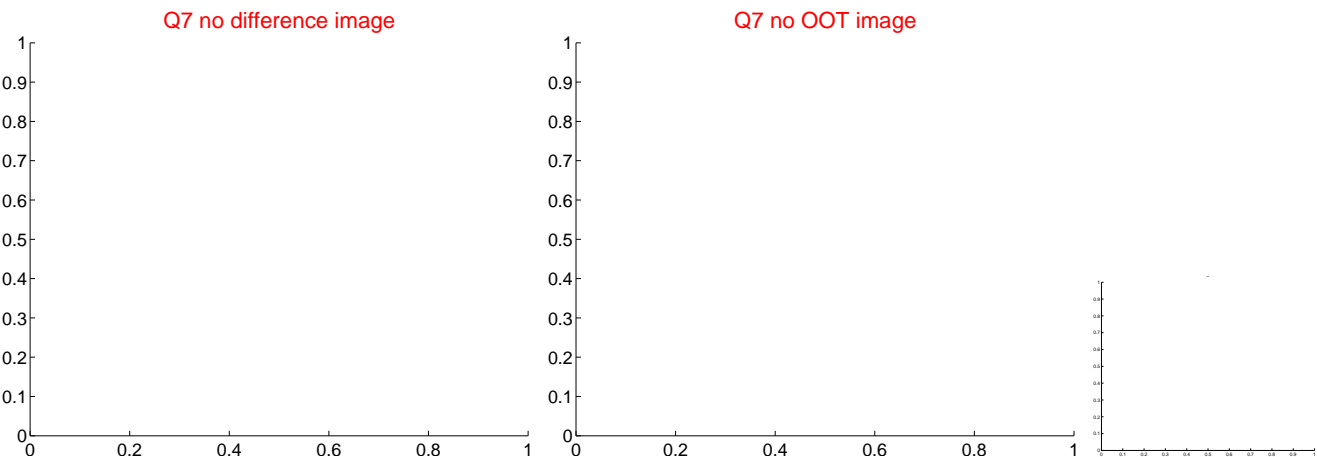
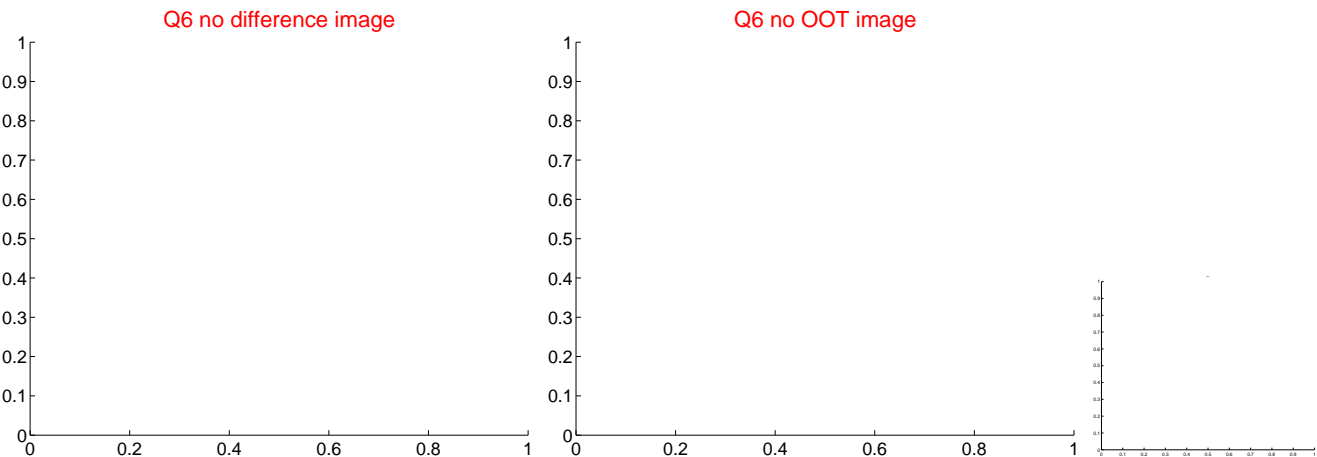
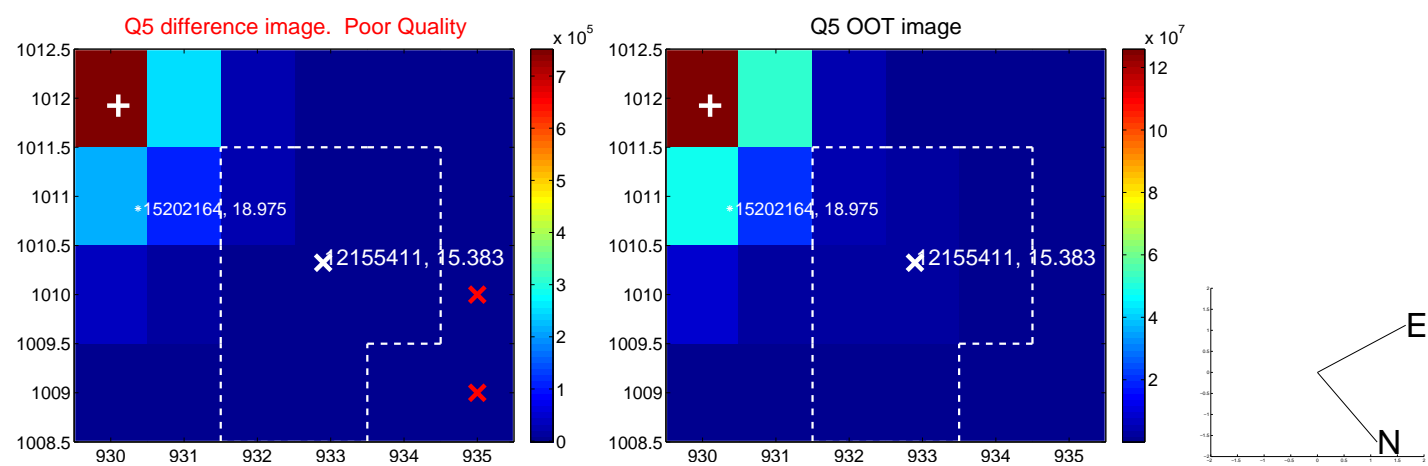


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

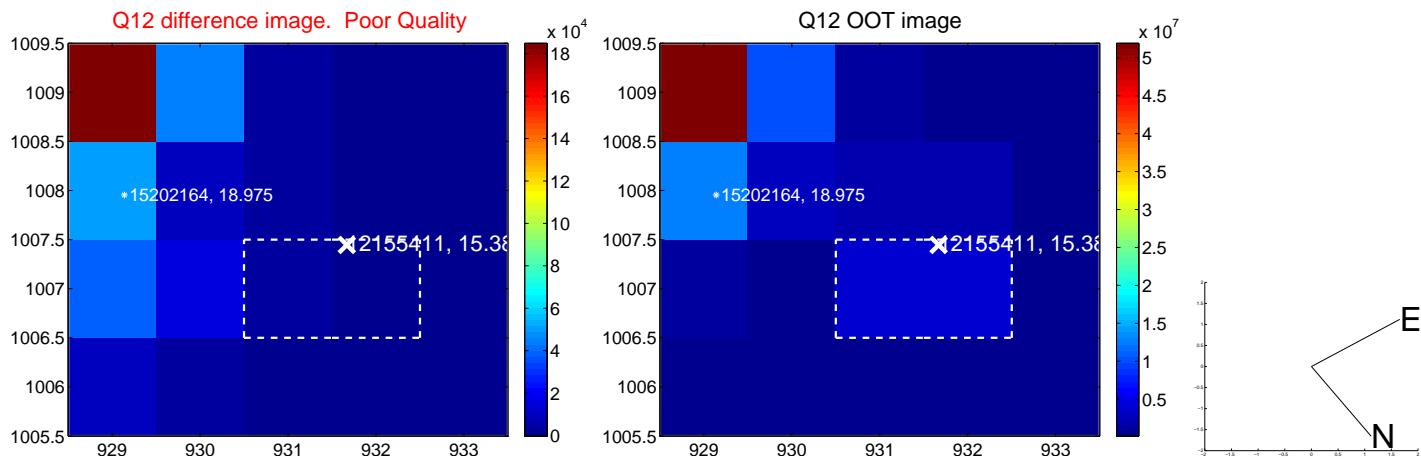
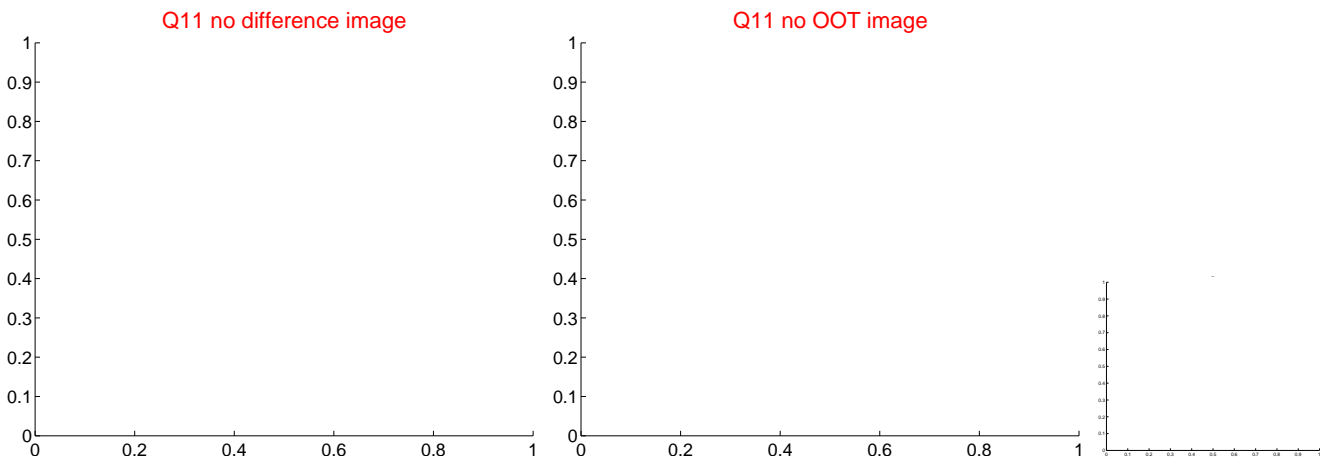
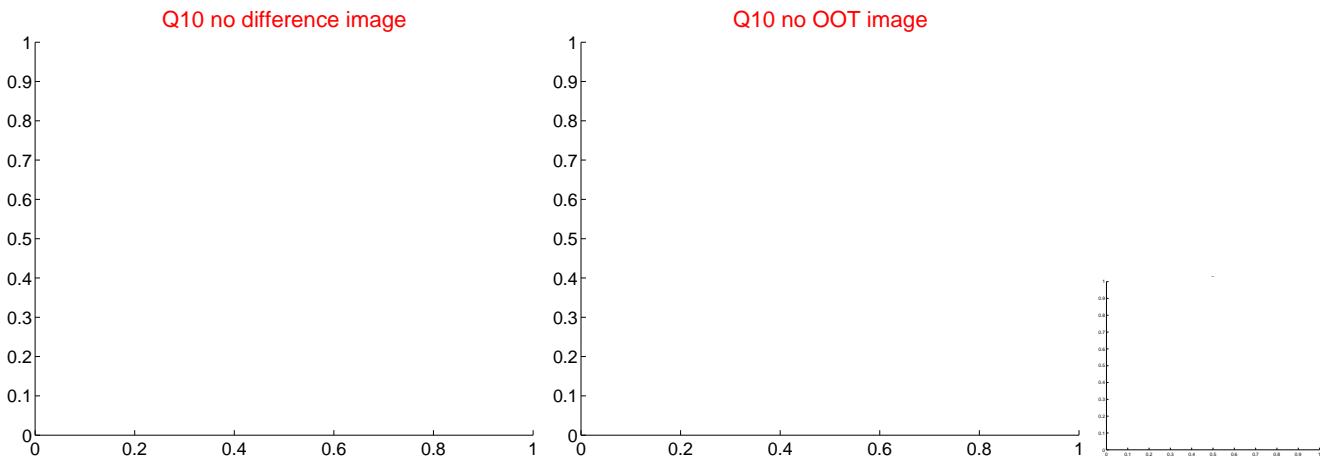
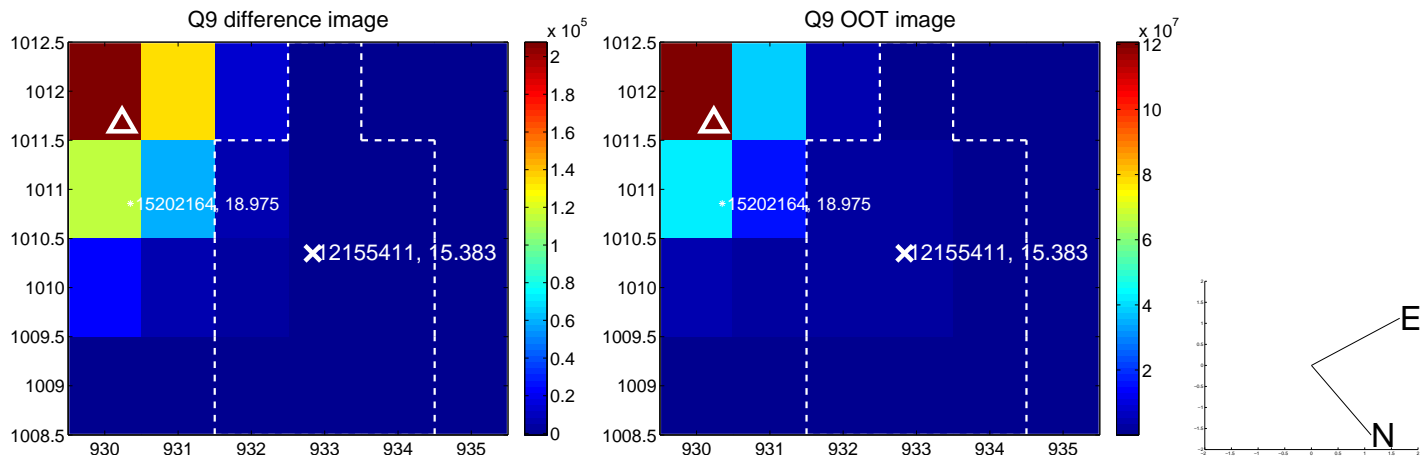
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



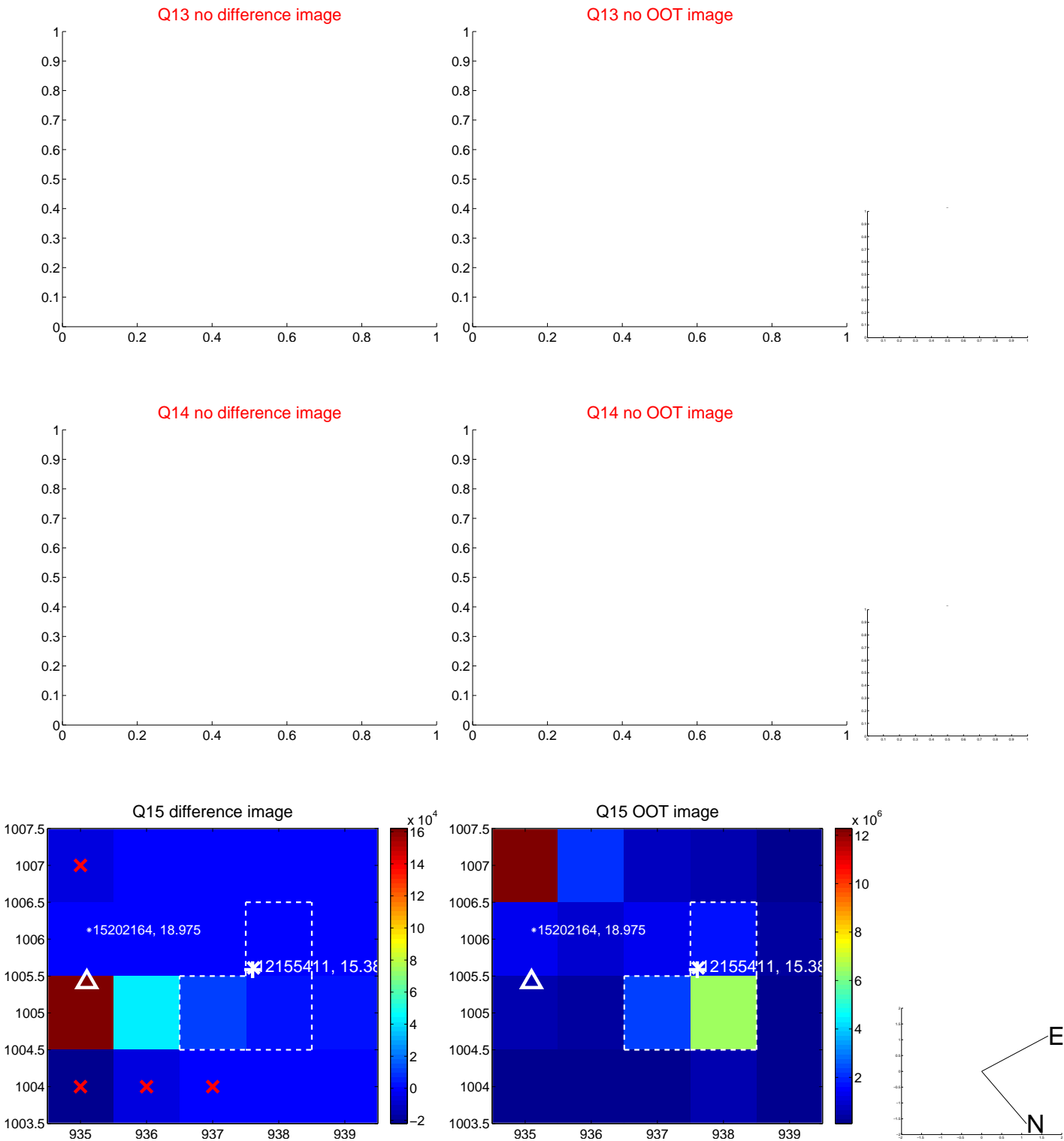
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



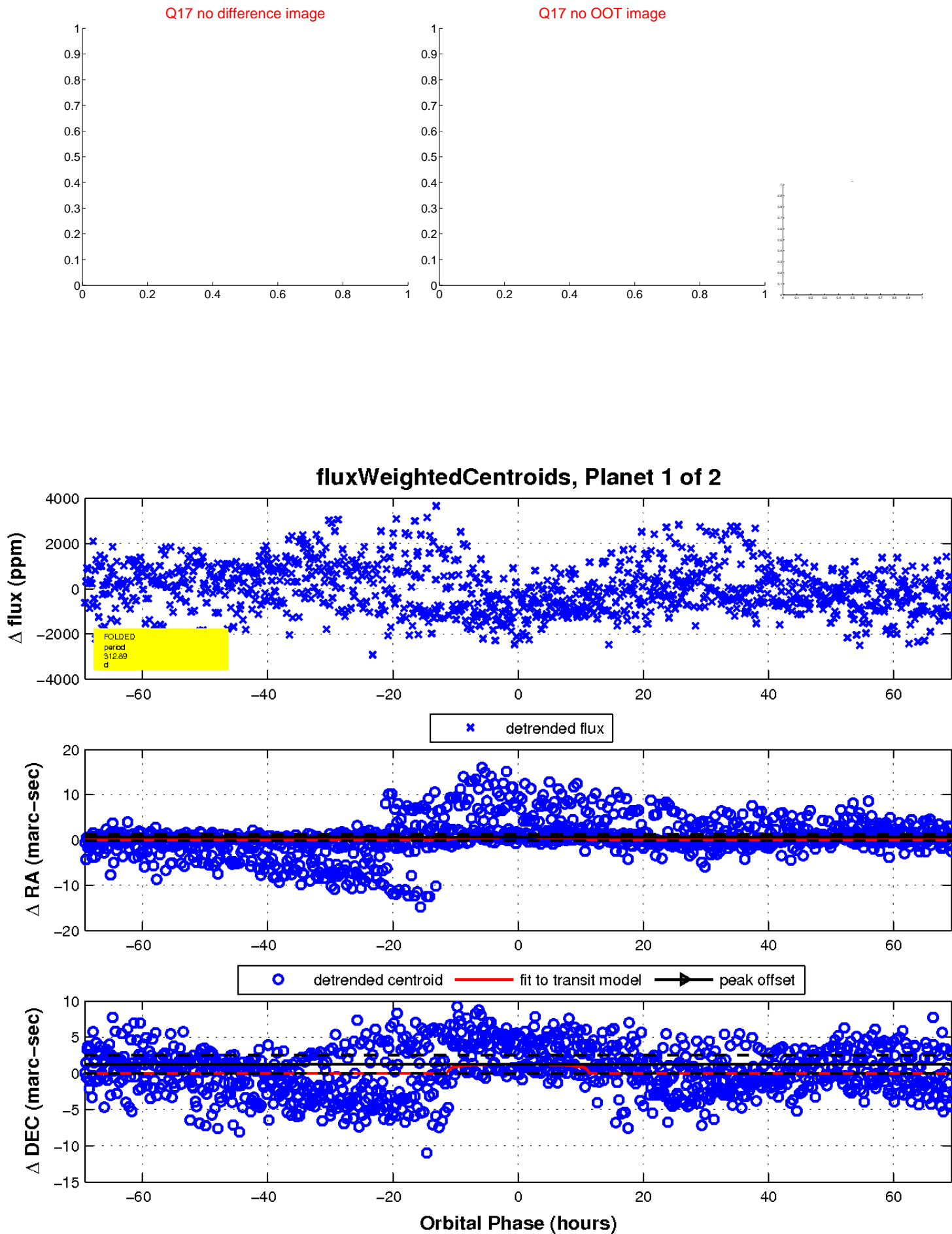
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

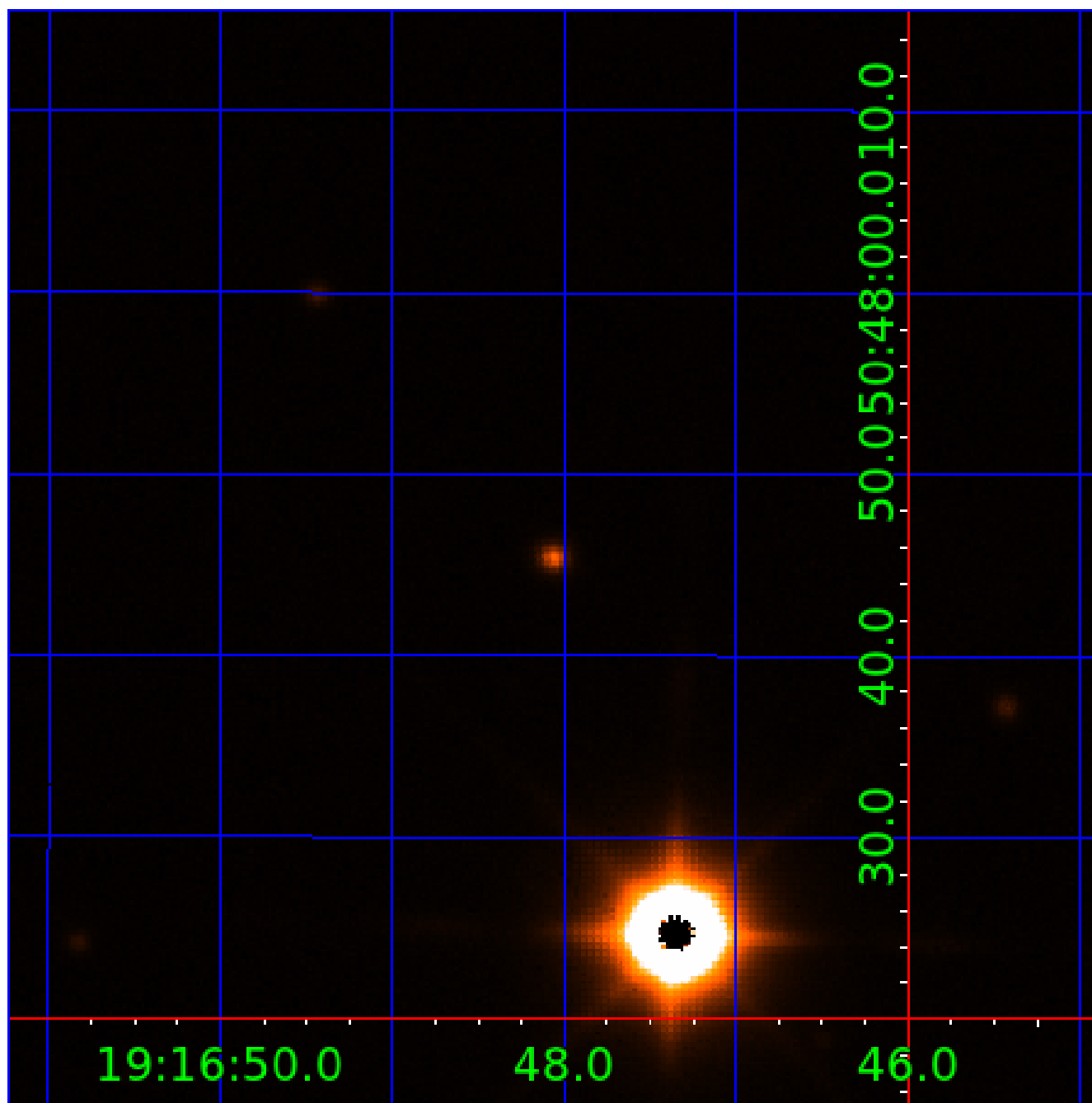


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012155411

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
012155411-01	OBS	No	312.893154	202.172264	869.2	23.102	8.9	7.8	0.92	5881	2.77	1.10
012155411-02	OBS	No	370.036917	243.545621	687.8	9.842	7.4	6.2	0.92	5881	2.71	0.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012155411-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
012155411-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

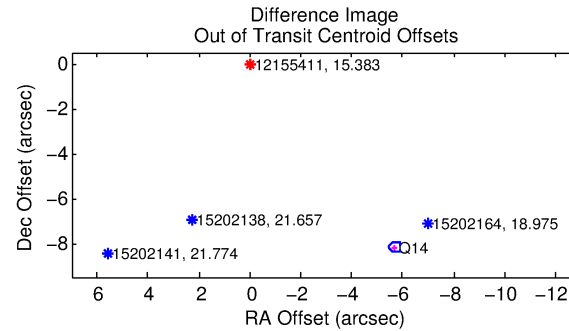
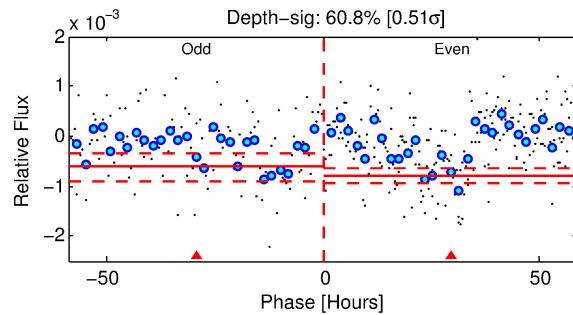
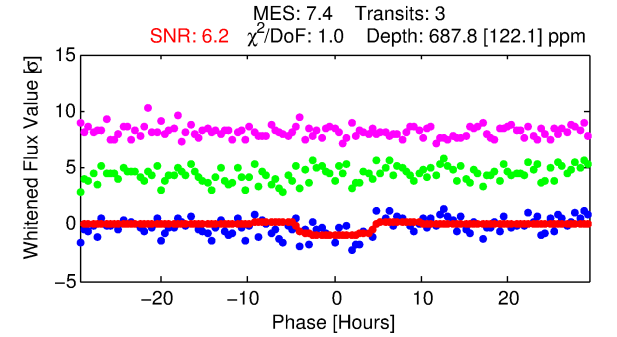
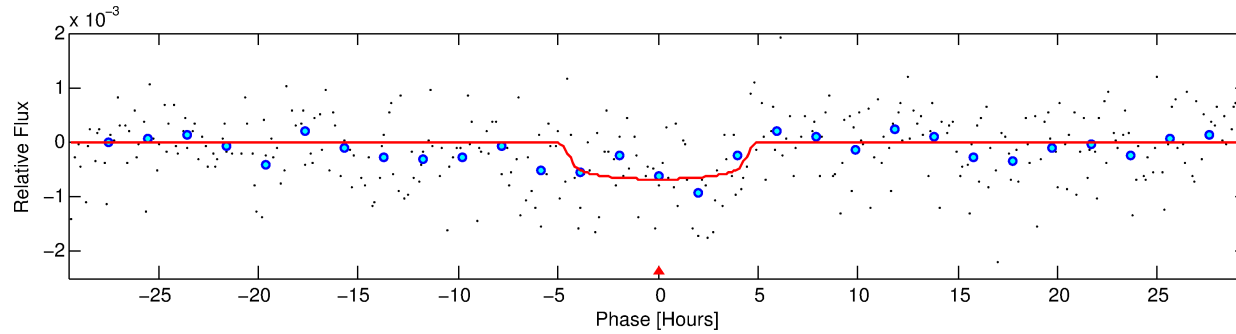
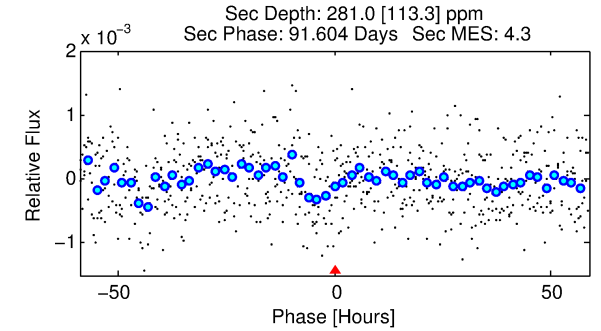
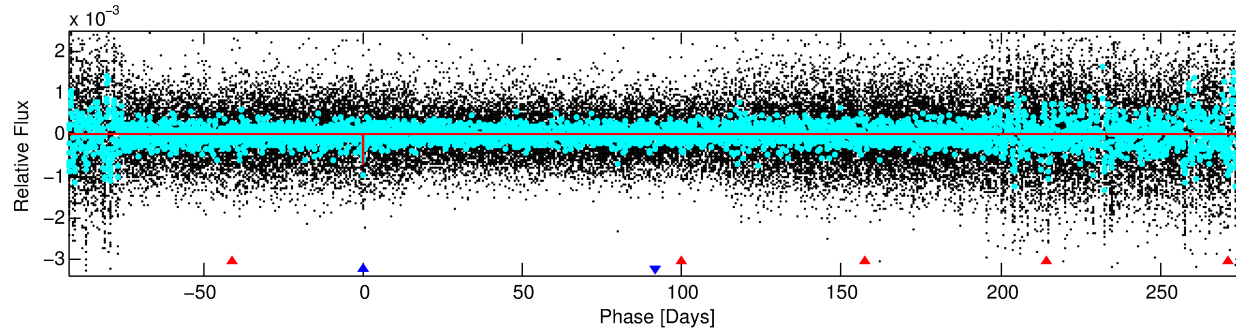
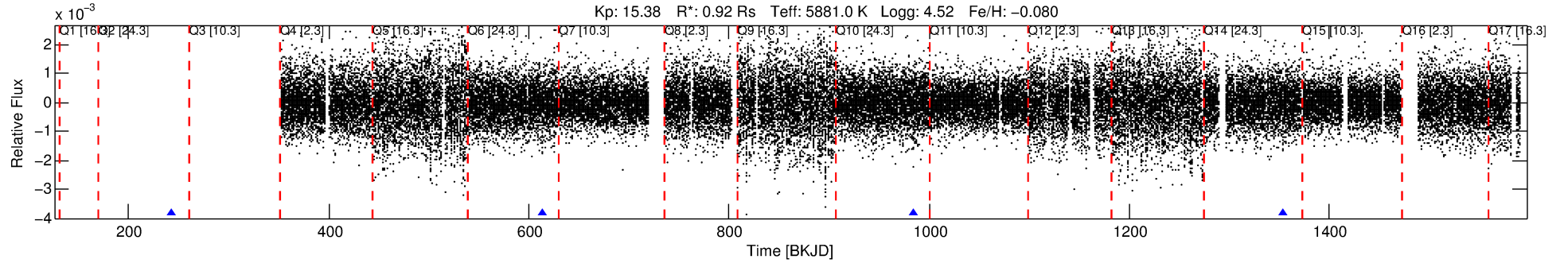
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012155411-02

No Significant Match Found

DV One-Page Summary

KIC: 12155411 Candidate: 2 of 2 Period: 370.037 d



DV Fit Results:

Period = 370.03692 [0.01740] d
Epoch = 243.5456 [0.0376] BKJD
Rp/R* = 0.0272 [0.0079]
a/R* = 171.32 [220.25]
b = 0.84 [0.47]
Seff = 0.88 [0.37]
Teff = 247 [26] K
Rp = 2.71 [1.15] Re
a = 1.0096 [0.2690] AU
Ag = 21438.19 [17404.25] [1.23σ]
Teffp = 4621 [834] K [5.24σ]

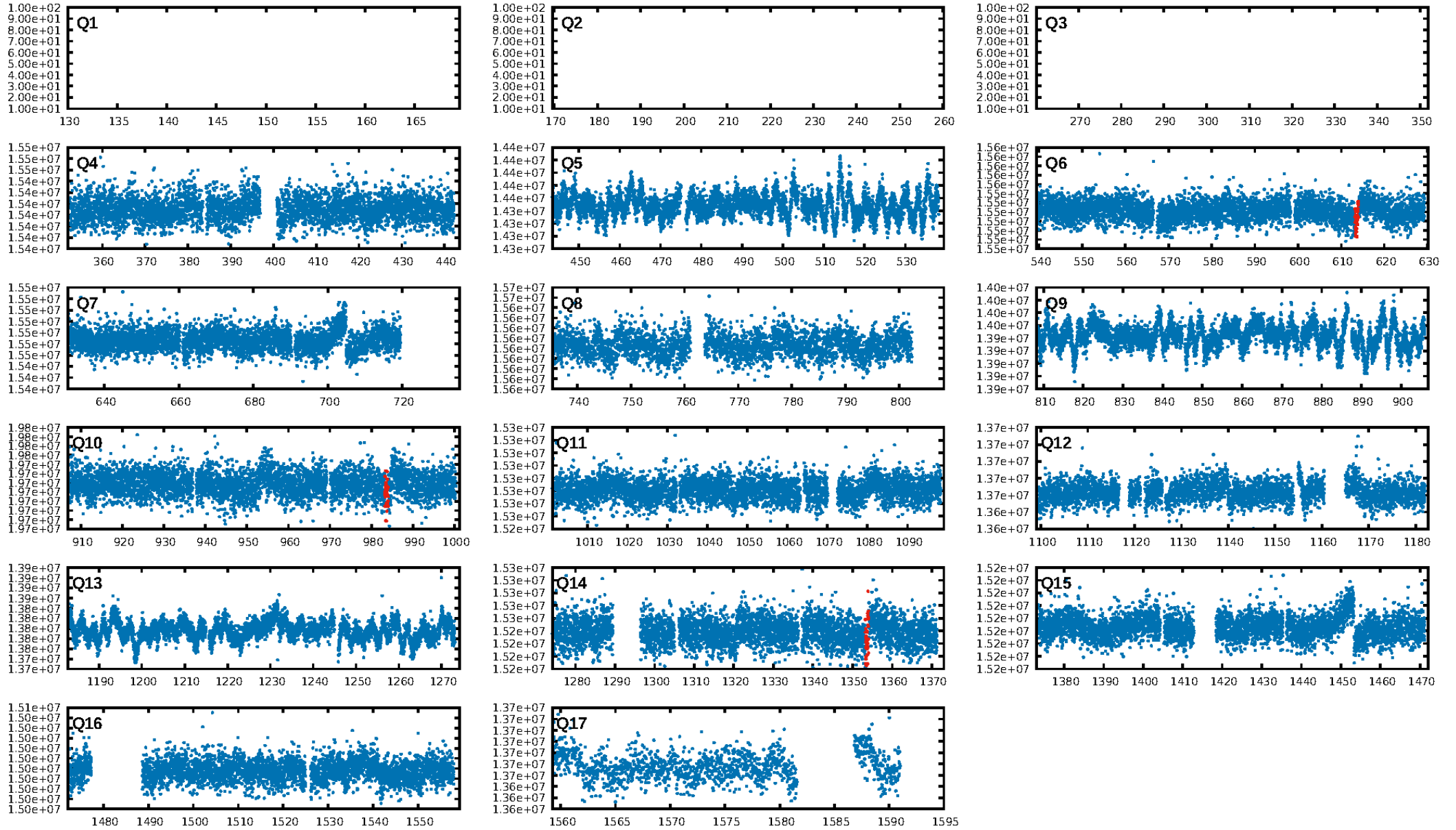
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.61σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 69.0%
ModelChiSquareGoF-sig: 89.9%
Bootstrap-pfa: 4.08e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.4362
Centroid-sig: 0.0%
Centroid-so: 17.478 arcsec [6.07σ]
OotOffset-rm: 9.971 arcsec [123.10σ]
KicOffset-rm: 9.974 arcsec [123.21σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
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DiffImageOverlap-fno: 1.00 [3/3]

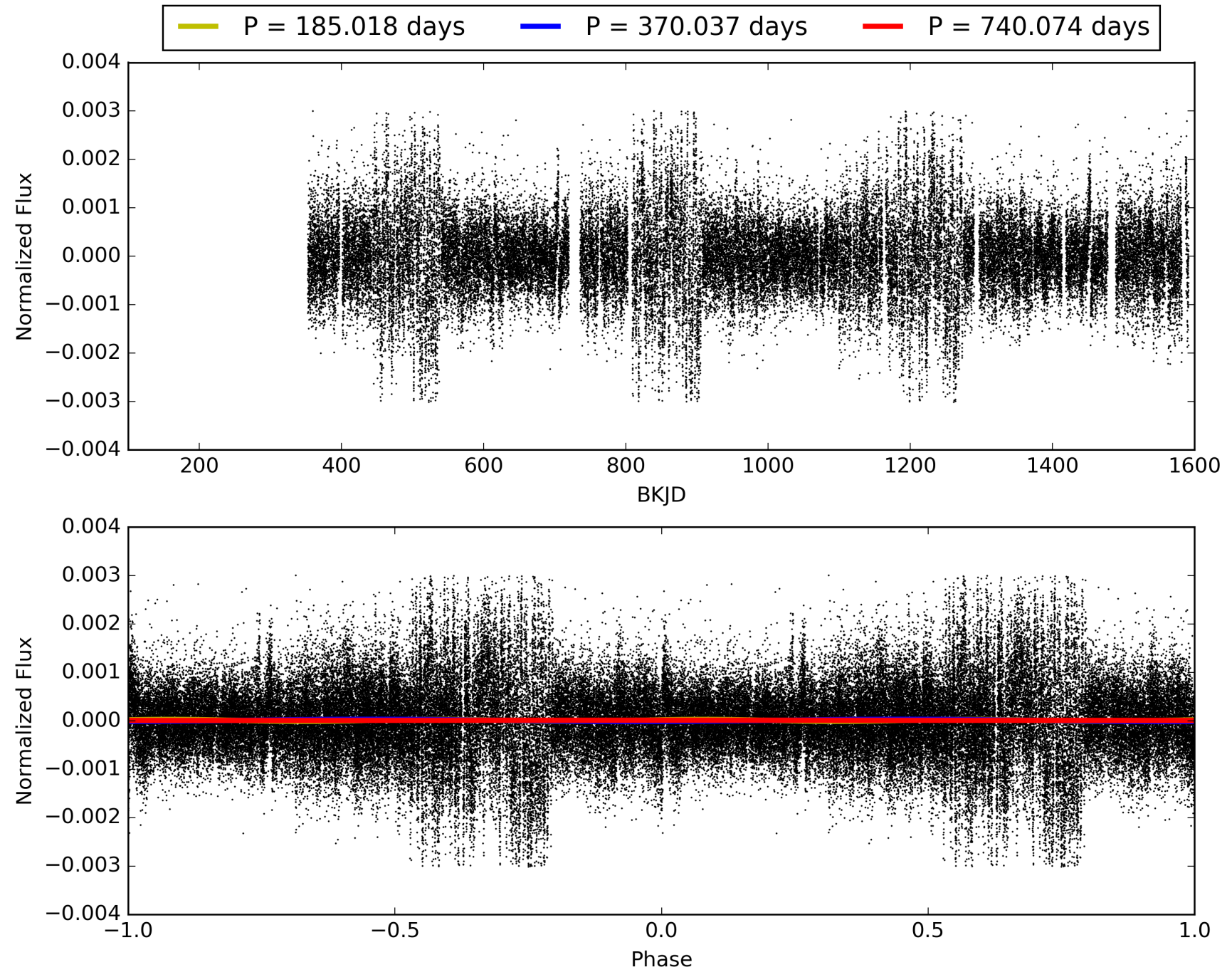
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012155411-02, PDC Light Curves

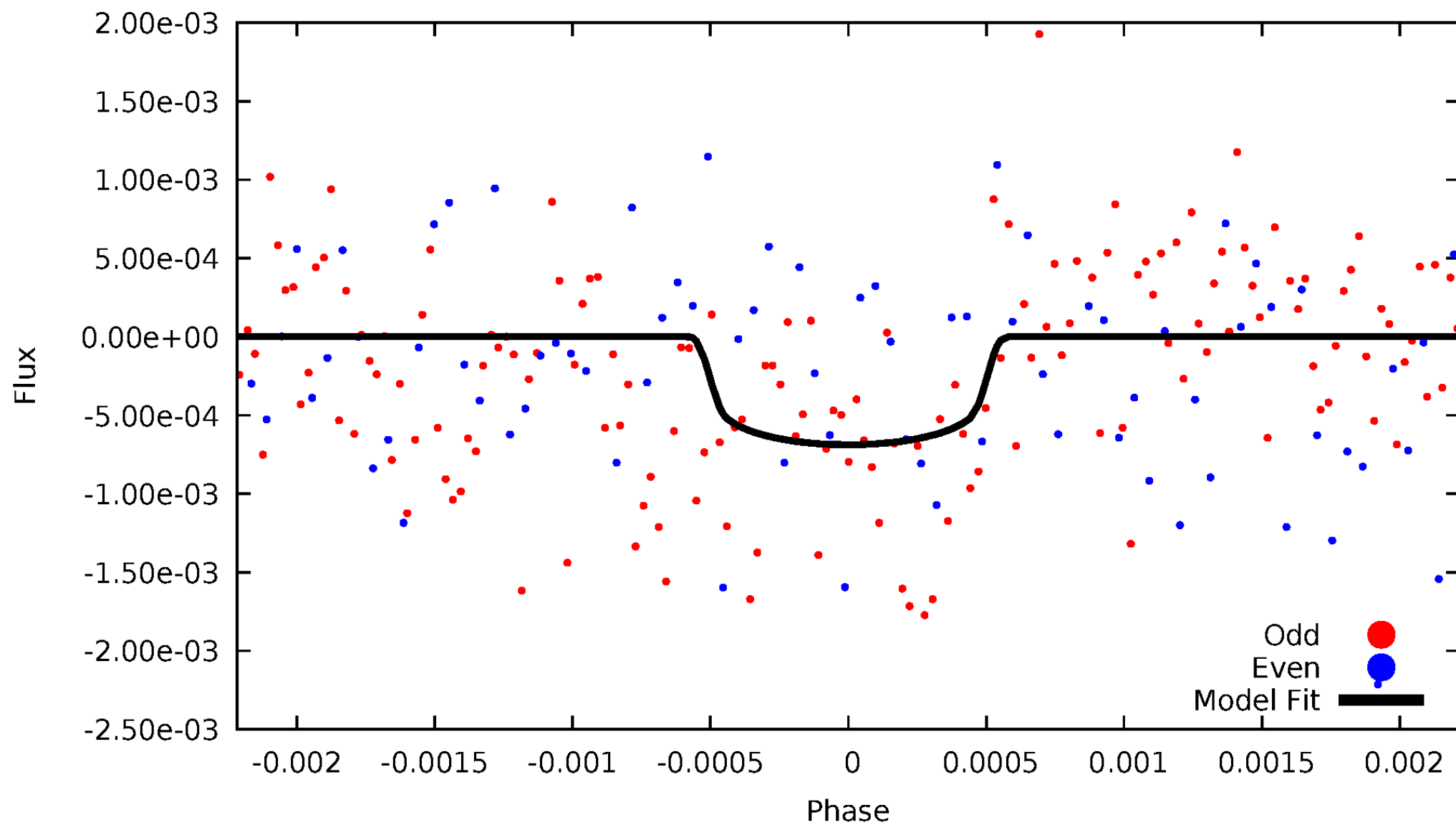


TCE 012155411-02



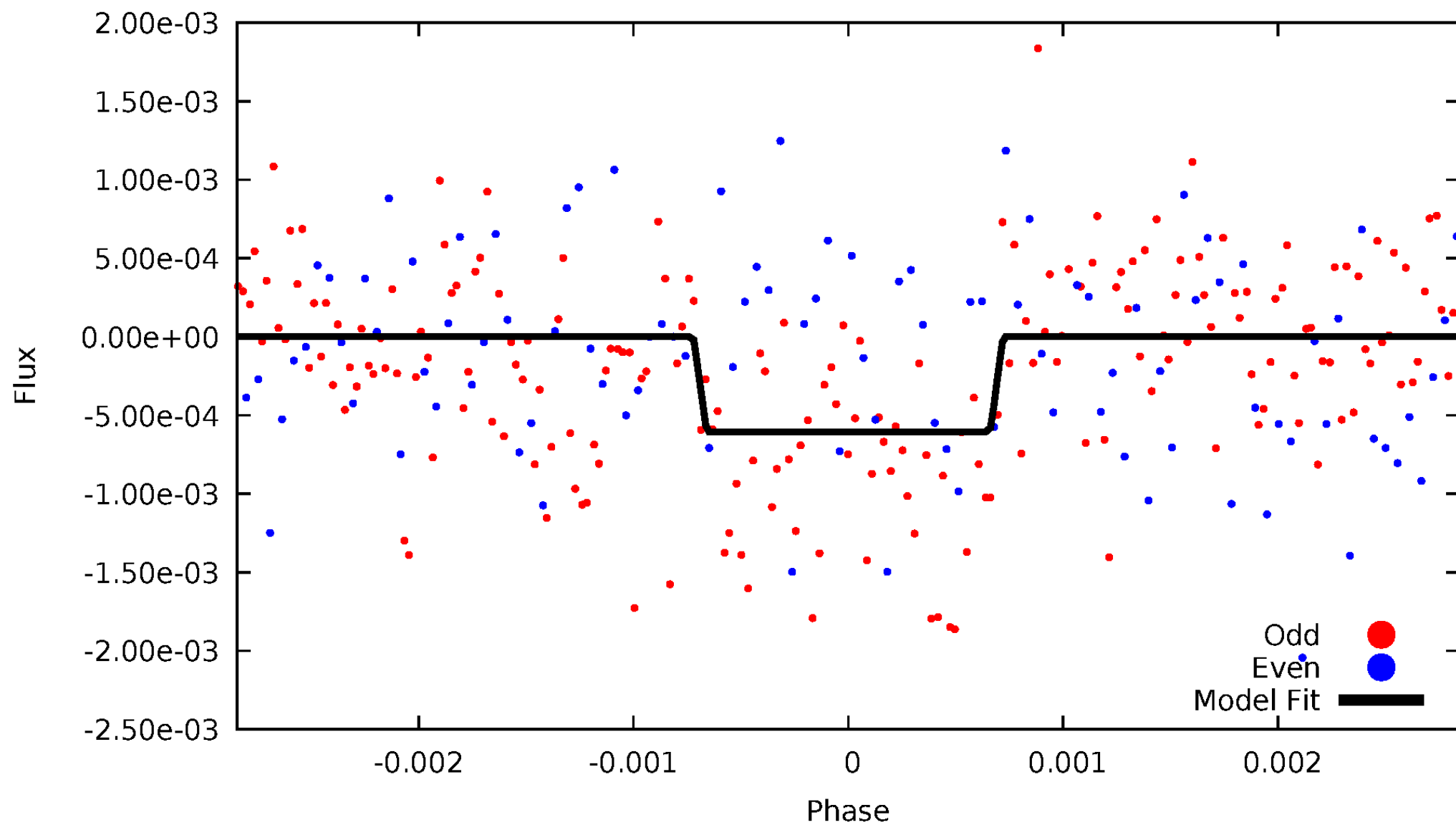
DV Odd/Even

TCE 012155411-02



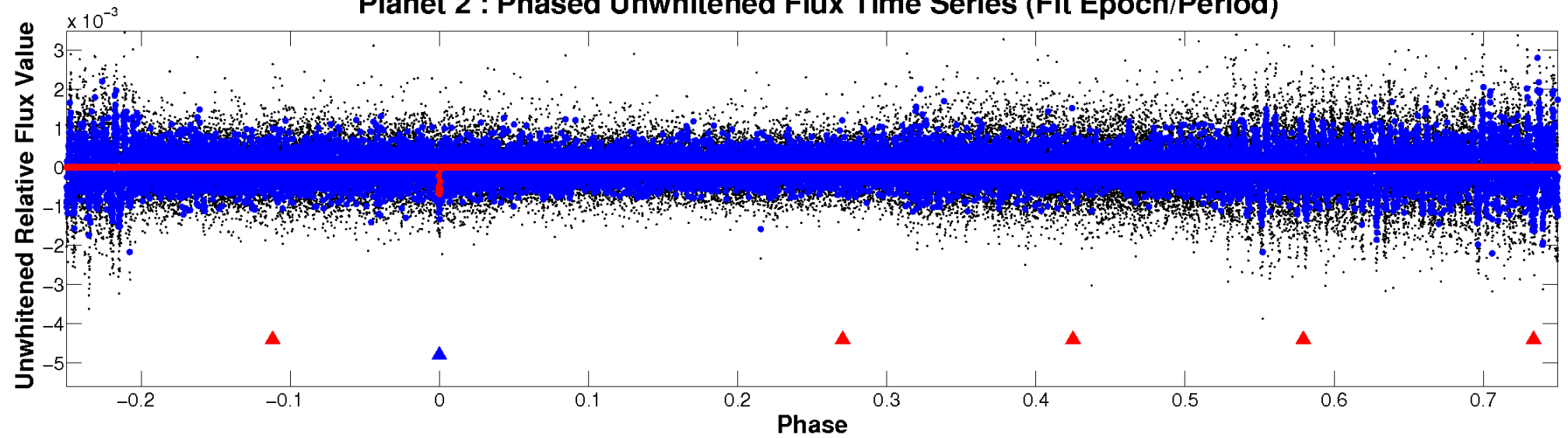
ALT Odd/Even

TCE 012155411-02

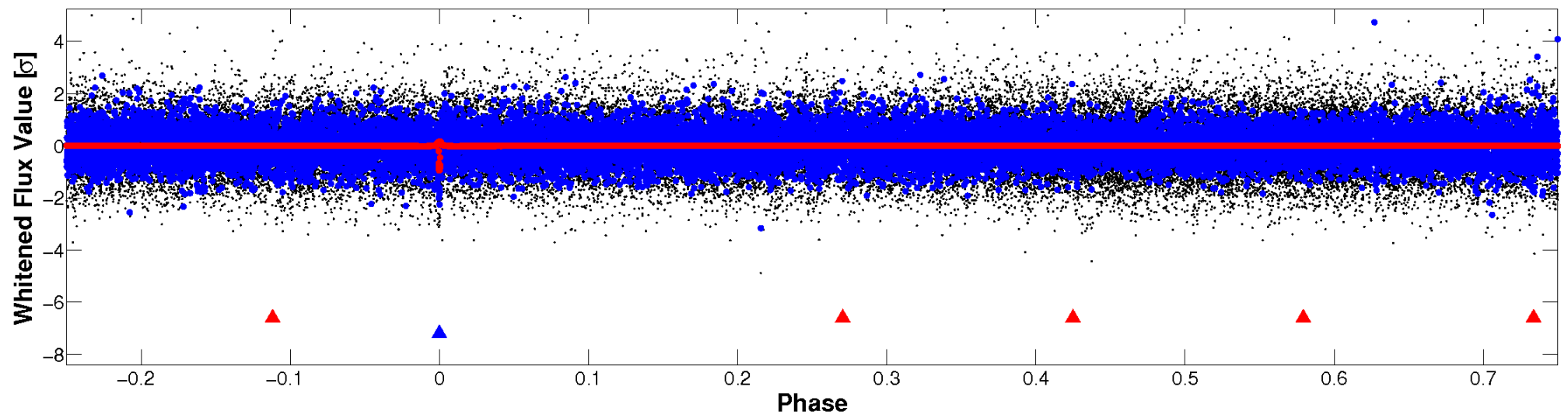


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

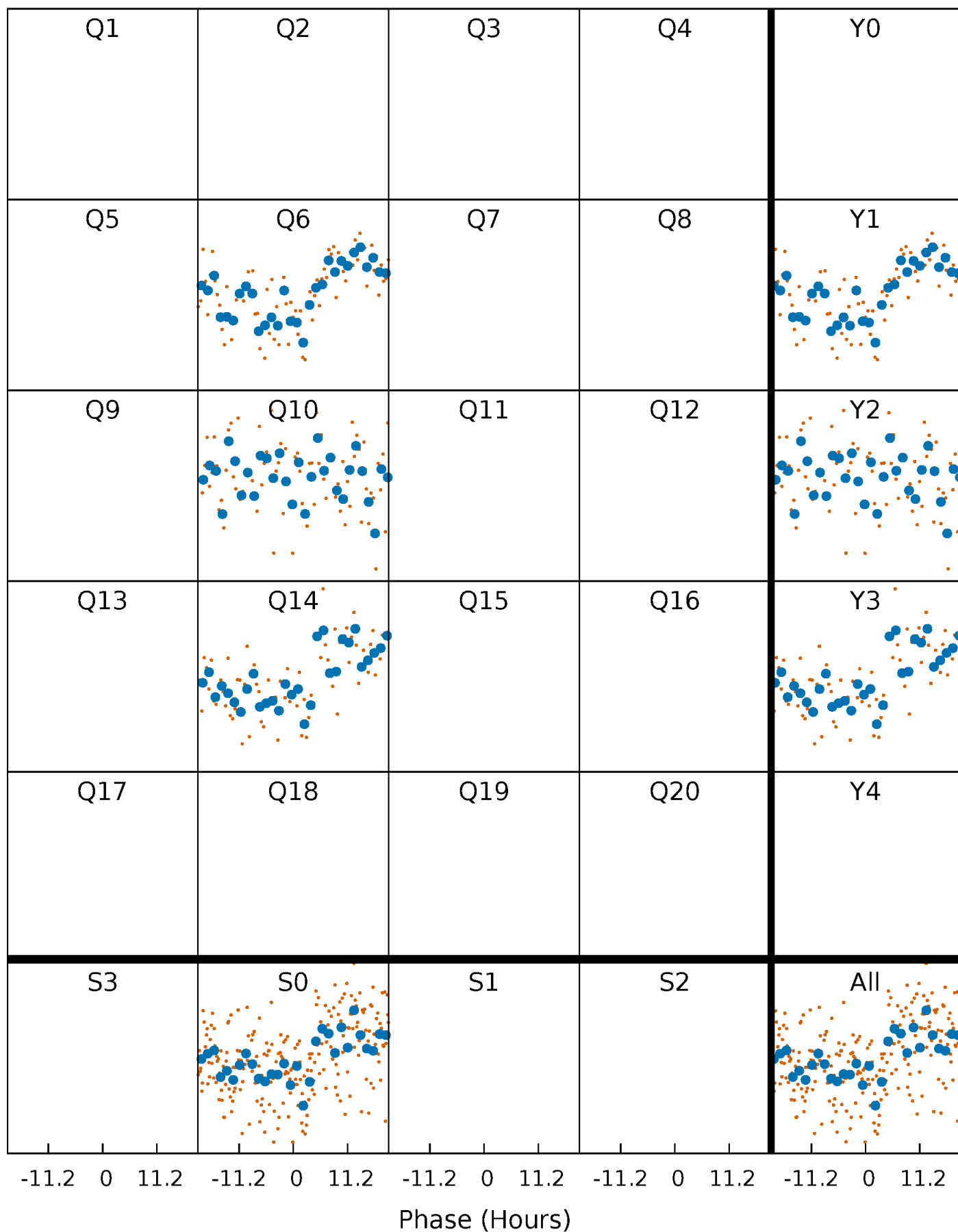


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



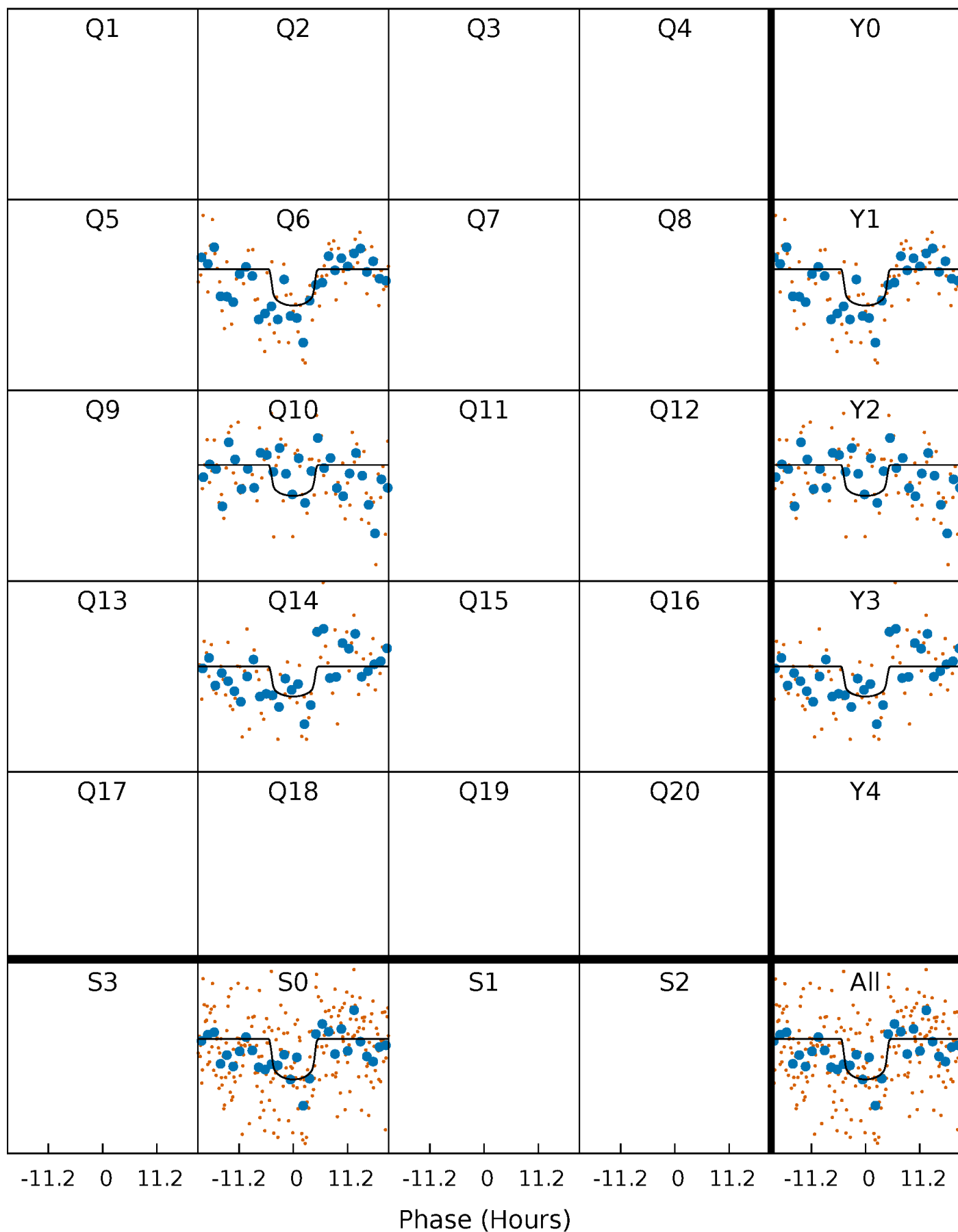
PDC Quarter-Phased Transit Curves

TCE 012155411-02 P=370.036917 Days $T_0=243.545621$ (BKJD)



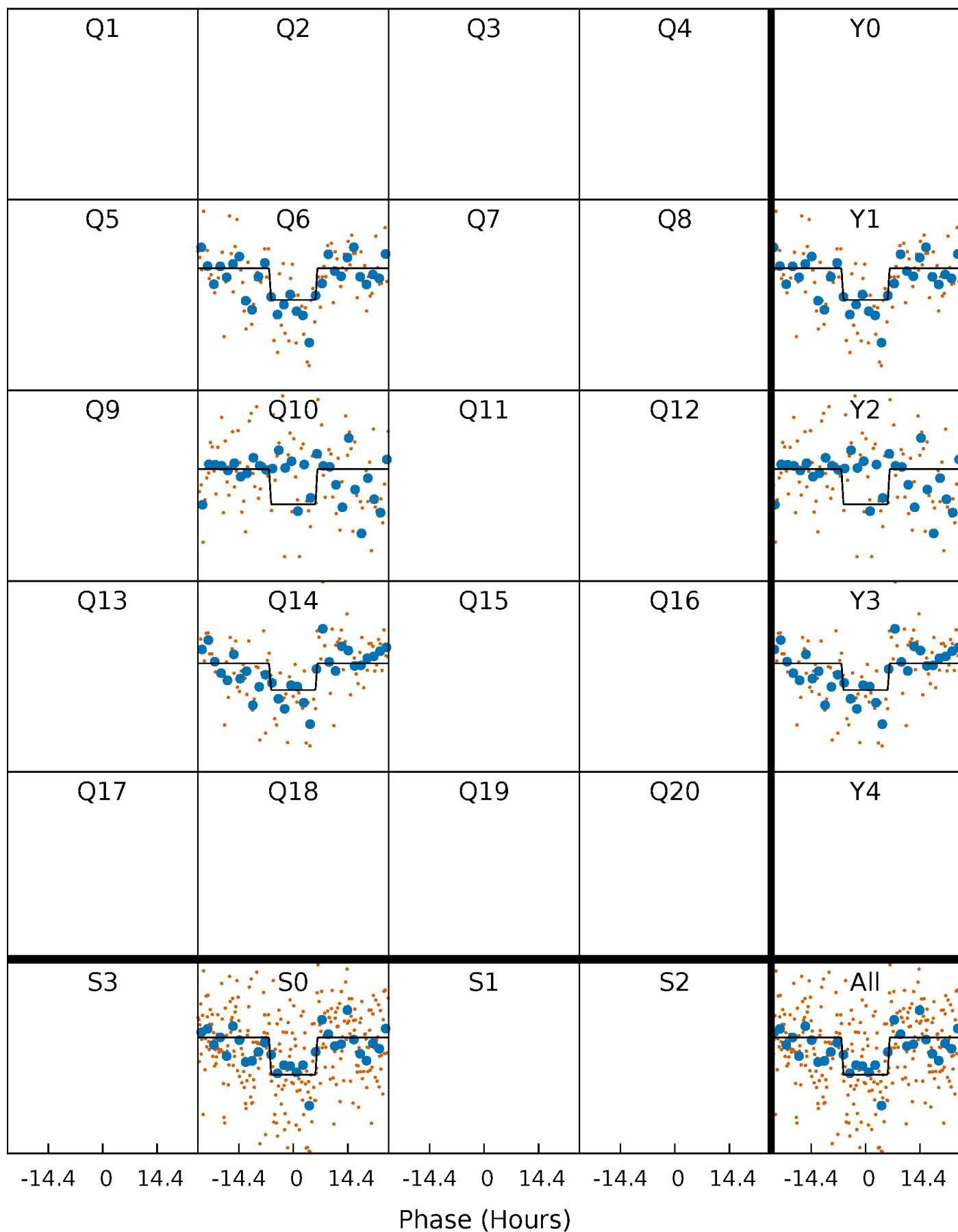
DV Quarter-Phased Transit Curves

TCE 012155411-02 P=370.036917 Days $T_0=243.545621$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

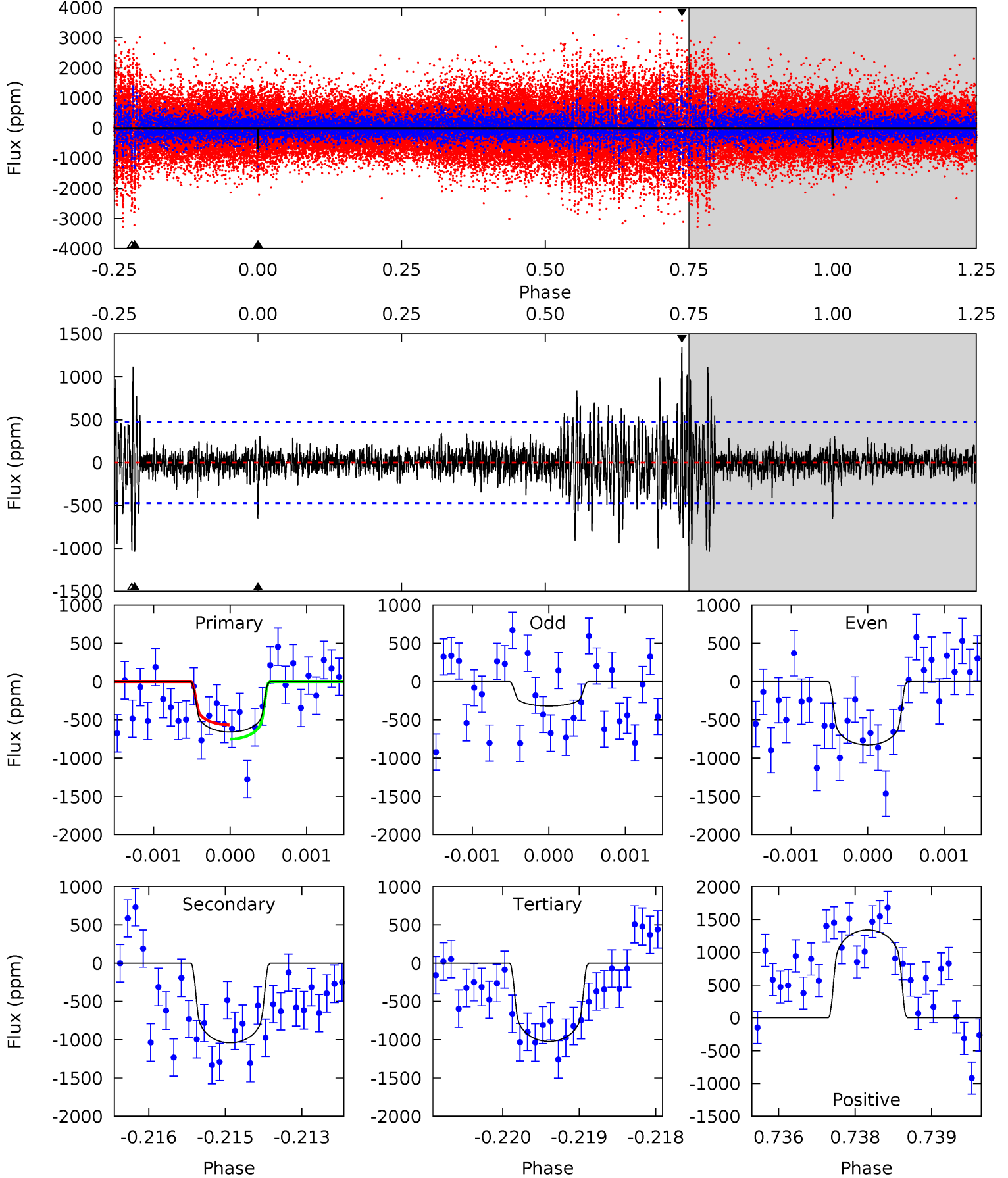
TCE 012155411-02 P=370.038149 Days $T_0=243.471727$ (BKJD)



DV Model-Shift Uniqueness Test

012155411-02, P = 370.036917 Days, E = 243.545621 Days

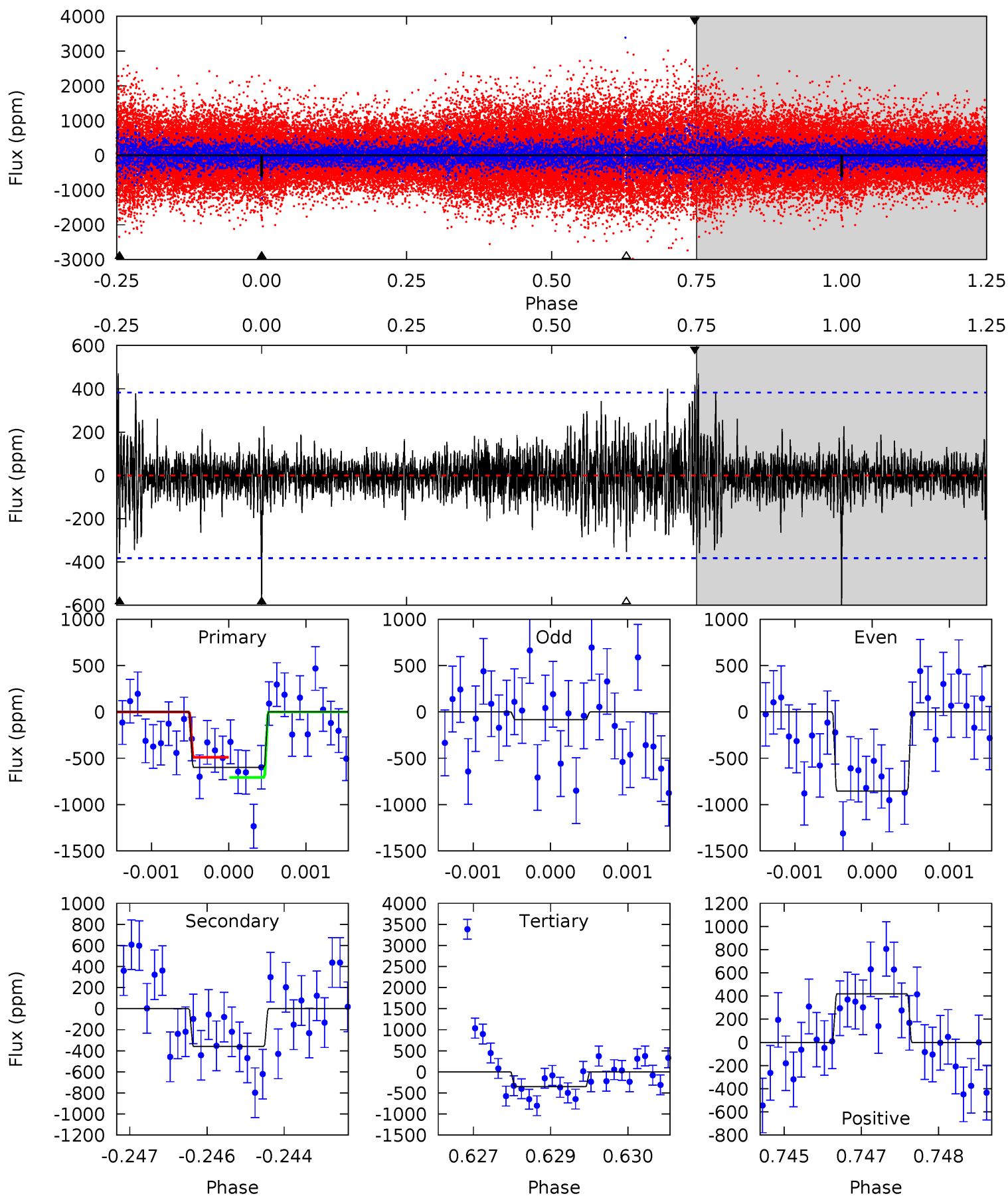
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.55	11.9	11.7	15.4	5.43	3.26	2.40	-4.17	-7.83	0.21	-3.44	2.76	0.85	0.56	1.07



Alt Model-Shift Uniqueness Test

012155411-02, P = 370.038149 Days, E = 243.471727 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.42	5.05	4.98	5.89	5.39	3.19	1.21	3.44	2.53	0.07	-0.84	5.06	0.71	0.44	1.53



Stellar Parameters For KIC 012155411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5881^{+164}_{-205}	$4.516^{+0.039}_{-0.221}$	$-0.080^{+0.300}_{-0.300}$	$0.915^{+0.282}_{-0.094}$	$1.002^{+0.127}_{-0.140}$	$1.840^{+0.389}_{-0.982}$
	+3%/-3%	+1%/-5%	+375%/-375%	+31%/-10%	+13%/-14%	+21%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 012155411-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1040 ± 87	$2.84^{+0.91}_{-0.88}$	355^{+27}_{-18}	6446^{+1500}_{-802}	70573^{+79322}_{-29840}
Alt.	-359 ± 71	$2.54^{+0.94}_{-0.80}$	354^{+26}_{-17}	5222^{+972}_{-663}	29434^{+34129}_{-14597}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

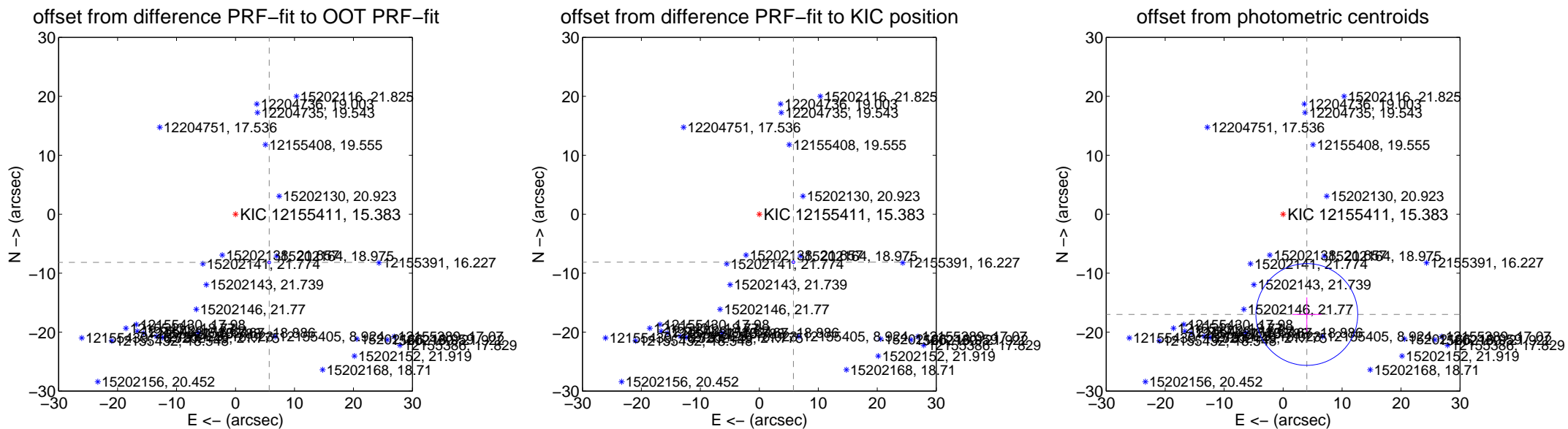
DV Centroid Data

Supplemental centroid analysis for 012155411-02. Kepler magnitude: 15.38. Transit SNR 6.19

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.971 ± 0.081	123.10	-5.714 ± 0.078	-8.171 ± 0.082
PRF-fit source offset from KIC position	9.974 ± 0.081	123.21	-5.782 ± 0.078	-8.127 ± 0.082
photometric centroid source offset	17.48 ± 2.88	6.07	-4.02 ± 2.45	-17.01 ± 2.90

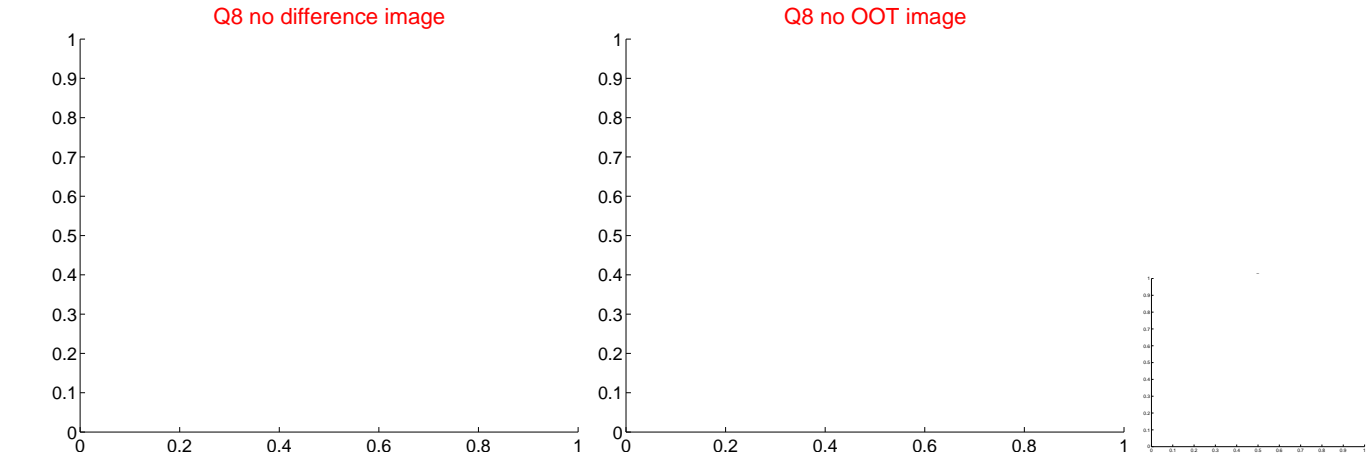
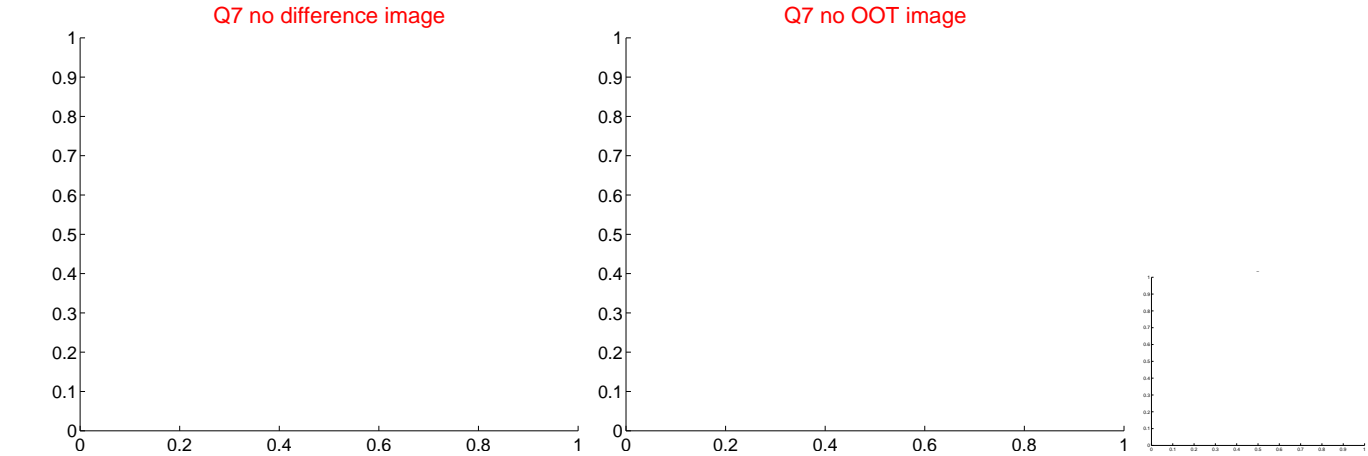
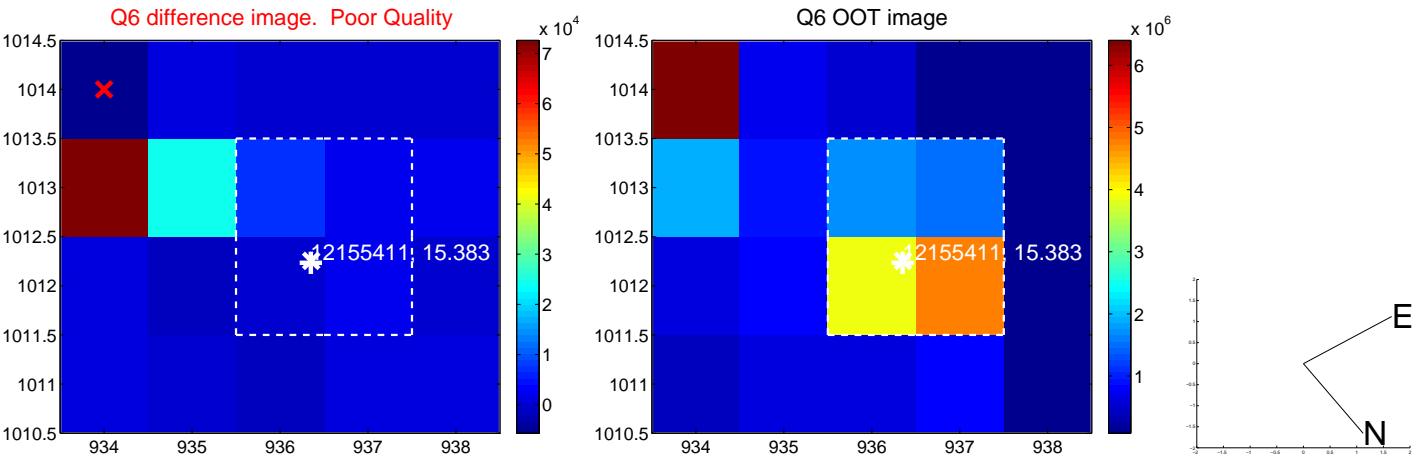
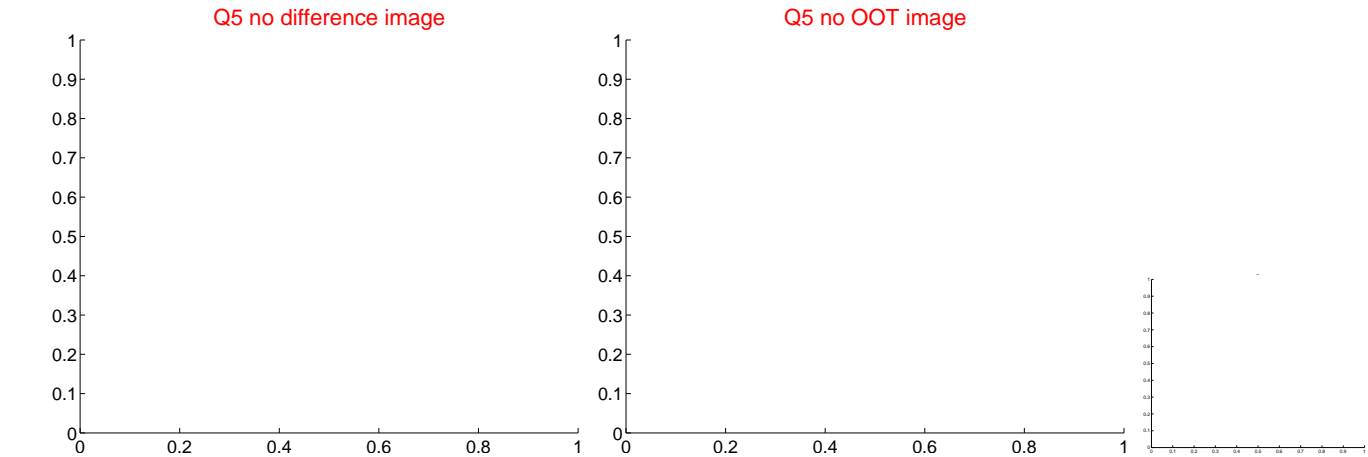


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs $> 15,000,000$ are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

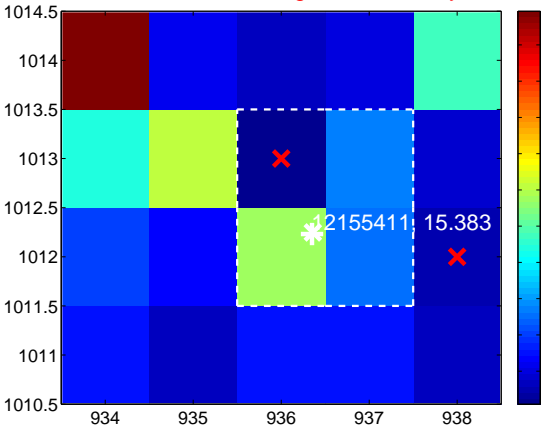
Q9 no difference image



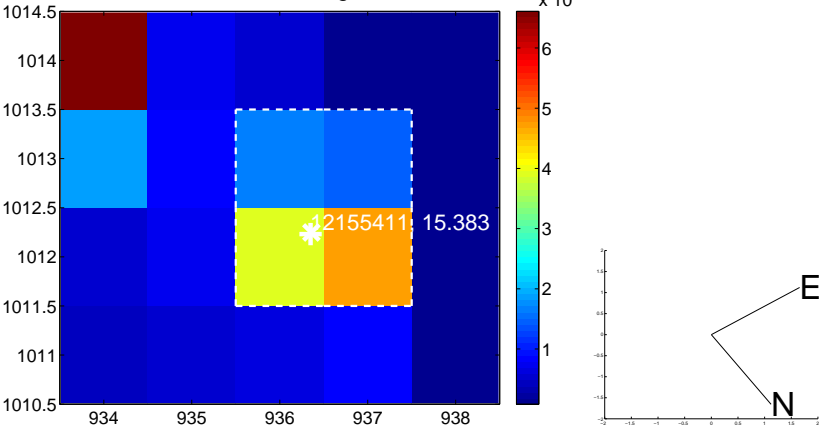
Q9 no OOT image



Q10 difference image. Poor Quality



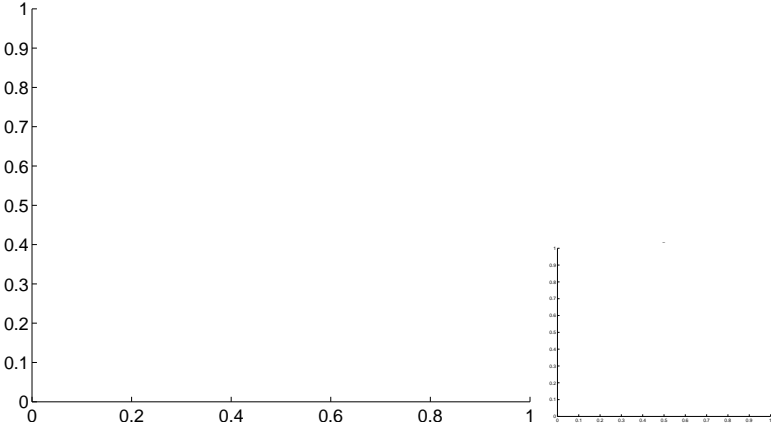
Q10 OOT image



Q11 no difference image



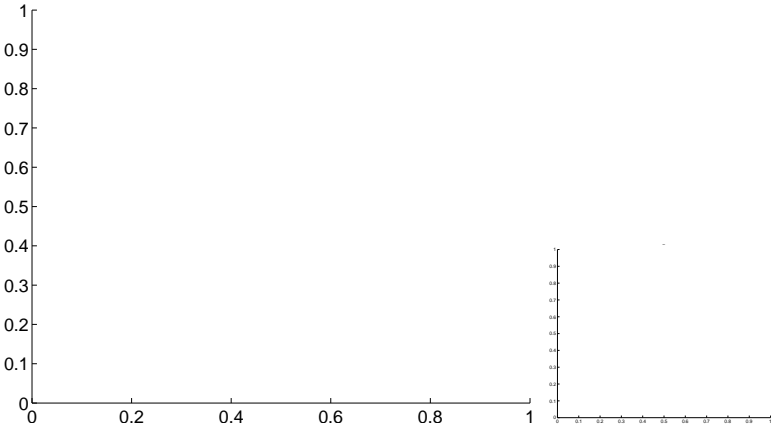
Q11 no OOT image



Q12 no difference image



Q12 no OOT image

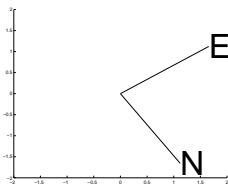
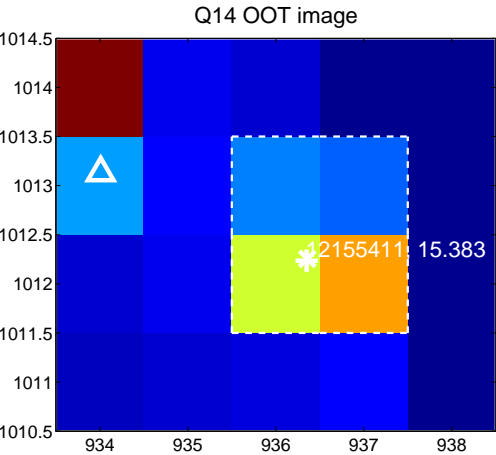
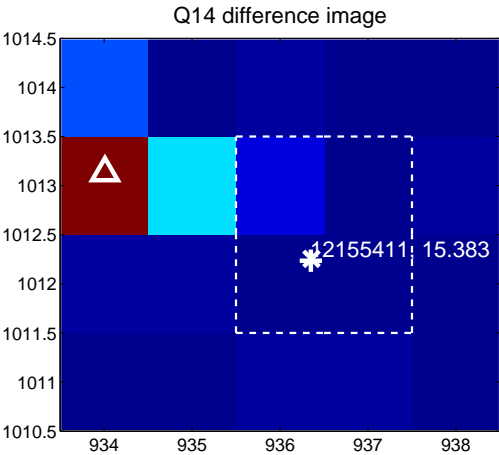


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

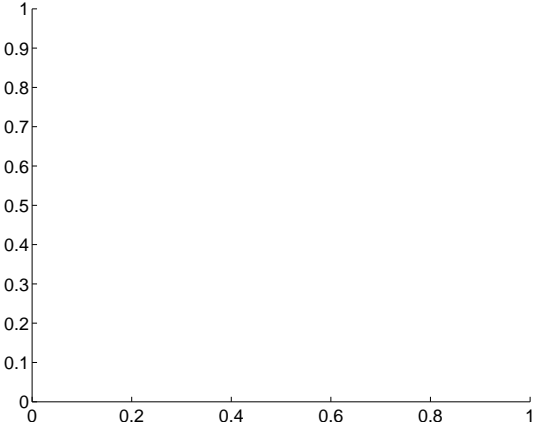
Q13 no difference image



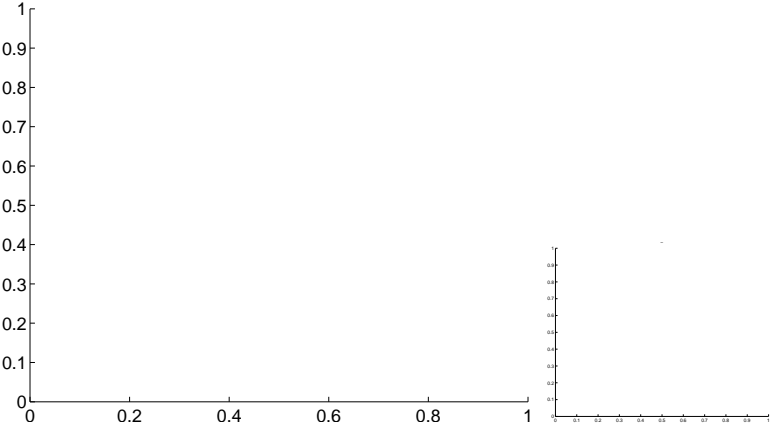
Q13 no OOT image



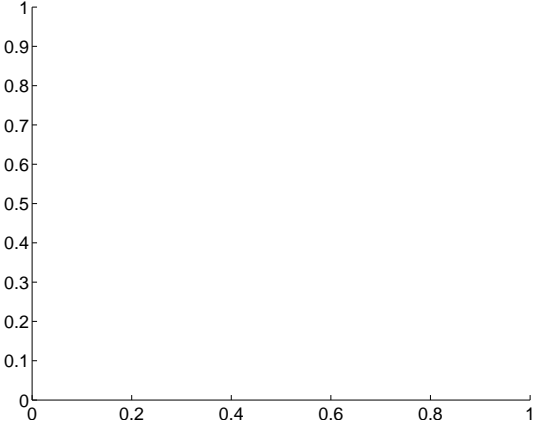
Q15 no difference image



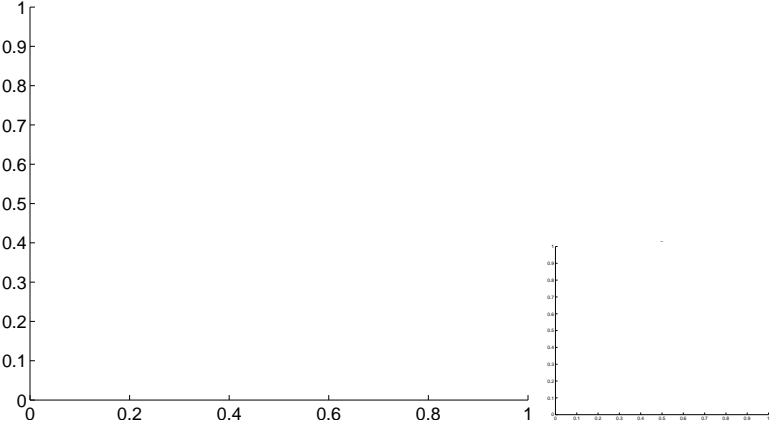
Q15 no OOT image



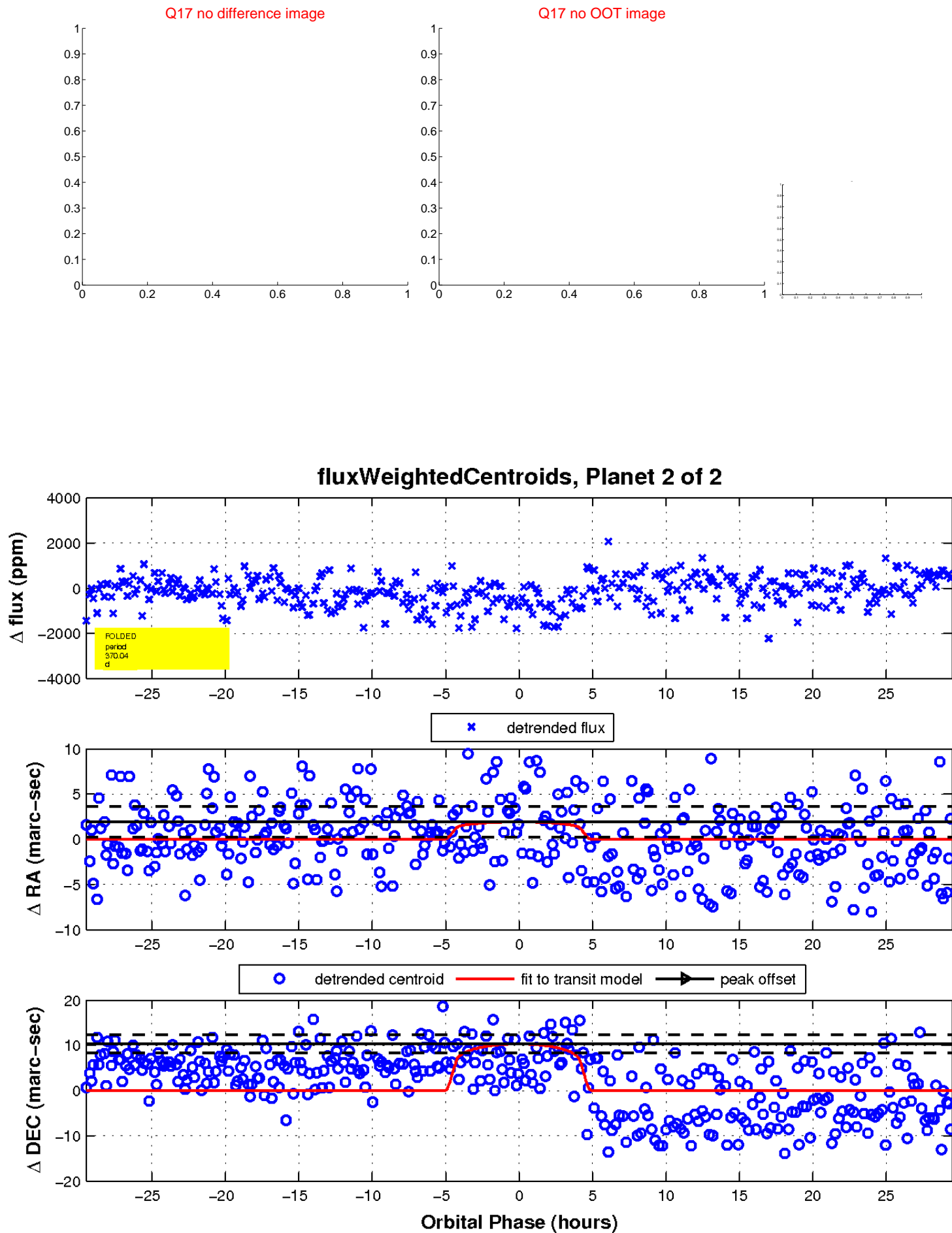
Q16 no difference image



Q16 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

